Specialized Oil Publications of
THE GULF PUBLISHING COMPANY

The OIL WEEKLY and The COMPOSITE CATALOG for the drilling-producing-pipeline industry

PETROLEUM REFINER and The REFINERY CATALOG for the refining-natural gasoline industry

LOOKING AHEAD
. . . with the Editor

THE RECENT renewal of exploratory interest in the Gulf Coast and Mississippi embayment area of Mississippi and Alabama, leading to the first commercial oil discovery in the latter state and the proving of major producing areas in Southern Mississippi, indicates that these two states will continue to receive active drilling attention from now on. Because of the great current interest in the oil possibilities of the area an early issue of THE OIL WEEKLY will include a feature article on the general geology of the basin area of the two states, with discussions of known and suspected structures and stratigraphic traps that offer the most promise as wildcatting localities.

THE OIL MAN'S CALENDAR

MAY 8-10	Regional Meeting, American Institute of Mining and Metallurgical Engineers and Spring Meeting Petroleum Division, Houston.
8-10	National Oil and Gas Power Conference (Oil and Gas Division, Power Division) ASME, Tulsa.
11-13	A.G.A., Natural Gas Department, French Lick, Ind.
17-18	Oklahoma Industrial Safety Conference, Tulsa.
25-26	Spring Meeting, Mid-Continent District, API, Division of Production, Mayo Hotel, Tulsa.
JUNE 13-14	Spring Meeting, Southwestern District, API, Division of Production, Rice Hotel, Houston.
OCT. 12-13	Texas Mid-Continent Oil & Gas Association, Houston.
NOV. 13-16	American Petroleum Institute, Stevens Hotel, Chicago.

THE OIL WEEKLY

ENGINEERING • NEWS • STATISTICS

Published by THE GULF PUBLISHING COMPANY, Houston, Texas

R. L. DUDLEY, *President, Publisher* — A. L. BURNS, *General Manager*

TOM W. NELSON, *Advertising Manager*

ADVERTISING STAFF

DICK SWINSKY.....New York
C. L. HASKINS.....Cleveland
H. G. FITZPATRICK.....Chicago
J. F. CARTER, JR.....Tulsa
J. W. CURTS.....Los Angeles
CHAS. WYATT.....Houston

BRANCH OFFICES

NEW YORK.....250 Park Ave. (17)
CLEVELAND.....1010 Euclid Ave. (15)
PITTSBURGH.....429 Fourth Ave. (19)
CHICAGO.....332 S. Michigan Ave. (4)
LOS ANGELES.....W. W. Wilson Bldg. Huntington Park, Calif.
TULSA.....Hunt Bldg. (3)
FORT WORTH.....W. T. Waggoner Bldg.
WASHINGTON.....Albee Bldg. (5)

CIRCULATION DEPARTMENT

G. D. CROFTON.....Manager

Member Audit Bureau of Circulation and Associated Business Papers, Inc.

EDITORIAL STAFF

WARREN L. BAKER
Editor

J. KENT RIDLEY
Managing Editor

SILAS B. RAGSDALE
News Editor

L. J. LOGAN
Associate Editor

DISTRICT EDITORS

B. F. LINE.....Washington
H. H. KING.....Fort Worth
ANTHONY GIBBON.....Tulsa
R. W. BYRAM.....Austin
E. S. BUNCH.....Los Angeles
ELTON STERRETT, A. R. McTER, DON L. CARROLL, TOM L. TURNER.....Houston

Contents . May 1, 1944

Volume 113, No. 9

The Changing Panorama 9

Technical and Feature Articles:

Government Interference Scored by IPAA 15
By WARREN L. BAKER

Maracaibo Drilling (Pictures) 20

Utilizing Natural Gas Would Aid United States Oil Supply 22
By SAMUEL F. PETERSON

Drilling Fluid for Completion of Shallow Wells 24
By W. H. FARRAND AND W. A. CLARK

Reservoir Data and Production Problems (Part B of No. 3 of a Series) 34
By E. M. KEMLER

Operations at Peak and Storage Reduced to Meet Demand 38
By L. J. LOGAN

Monthly Activity Trends (Charts) 39

Practical Operating Hints for the Production Man 44

News and Departments:

Looking Ahead with the Editor 7

Washington Roundup 11

Letters 65

Markets, Statistics and Prices 52

United States Field Operations 55

United States Exploratory Completions 61

United States Wildcat Starts 63

Squeaks from the Bull Wheel 64

Notes for the Equipment Buyer and User 67

Index to Advertisers 68

CENSORSHIP NOTICE—Censorship rules occasionally make it necessary to tear out or otherwise delete parts of publications destined to subscribers outside the United States. If there be such deletions in copies of THE OIL WEEKLY going abroad, they are at the request of the Office of Censorship. Copies sent abroad face unavoidable delay because of time necessarily consumed in passing the publication through the Office of Censorship.—*The Publisher.*

Published Every Monday. Single Copies 15 cents (Except Special Issues). Subscription price: domestic and foreign, $2.00 a year; 2 years, $3.00. Advertising rates on application.
Copyright 1944 by The Gulf Publishing Company.

We Pioneered BAKELITE For Your Protection

Larkin pioneered the use of plastics in the manufacture of floating and guiding equipment. Exhaustive research proved beyond question that Fabric-Base Bakelite is the plastic most perfectly suited to this service, because

1. **High impact strength**
2. **High compressive strength**
3. **Abrasion resistance**
4. **High bending strength**
5. **Drillability**
6. **Low specific gravity**
7. **Water, oil and weather resistance**

This ideal material, plus proper design and precision workmanship, has made Larkin its leader in the field It is available only in Larkin equipment

LARKIN consistently builds better cementing equipment at no premium in price.

LARKIN

LARKIN PACKER COMPANY, INC.

SAINT LOUIS, MO.

WAREHOUSES: Houston, Corpus Christi, Odessa, Shreveport, Tulsa, Great Bend, Salem. EXPORT: 74 Trinity Place, New York City

The Changing Panorama

Under-Secretary of Petroleum Suggested

WE RESPECTFULLY submit to both the Democratic and Republican parties that at their coming conventions each should endorse a plank looking toward the creation of a position in the Department of State to be known as the under-secretaryship of petroleum.

From now on, the international oil situation will be important to the American people. Our government should recognize its importance and the most practical way to do it is for the State Department to have an under-secretary of petroleum. In the technical set up of the State Department a mere advisor has little standing, regardless of his training in the field in which he specializes. An under-secretary would have infinitely more prestige and influence and the dignity of the office would be such as to make it possible to attract to the position men of outstanding ability.

Senate Committee Most Unorthodox

HEARTENING to a degree that makes it hardly believable is the statement that the current Senate investigation of the world oil industry will not engage in the collection of statistics or make any factual surveys duplicating work already done by other agencies. The public, then, is not to have concocted for it another set of prophesies of the pending exhaustion of oil, for its further confusion; and without any facts before it, the committee's report will not have to disregard its facts when it makes its report. This is most unorthodox.

How futile is any action by any Congressional authority is the statement from Mr. Ickes that while the Senate in its august might is setting out to formulate a "world oil policy," he is continuing with his establishment of such a policy without the benefit of governmental sanction.

Startling as it may be to leave out setting up a new set of facts and figures, this investigation will prove far from unique. It still will have in common with its predecessors the record of having wasted its time and the time of the witnesses it hears, and have only its report for a result. So far investigations of the oil industry have not put one gallon of gasoline in a motor tank nor put one drop of oil on a bearing.

"We see little parts of the planning in the grand manner revealed here and there through this spokesman and that, and the conclusion is inescapable that the philosophy of some in important places is to render impotent the independent oil industry. We hope to show in the coming hearings before the Senate Committee that the petroleum price policy which has been pursued ever since price control began has been contrary to the welfare of the nation. The policy has been one of restricting energy at the time when it was most needed, and that has been the factor which has contributed most to the shortage of petroleum."

RUSSELL B. BROWN, *Independent Petroleum Association of America*

Politics Getting In Its Licks

THE government's action on the Montgomery-Ward case shows to what lengths the administration will go to support the political adjunct to the New Deal party known as the CIO. As a matter of cold fact, those who are well acquainted with the CIO have known for a long time that it is just another name for American Communism, that it isn't a labor movement, and that for the first time in American history the government has aided in forcing American citizens to join, willy nilly, a political party and pay dues thereto, if they wanted to work.

The Montgomery-Ward action will please CIO leaders but we predict that it will cause a wave of disgust to sweep the country because it shows conclusively that politics is the never ending guide of President Roosevelt and his left-wing associates.

And while we are predicting, we will go a little further. In order to get votes many of the obnoxious features of rationing will be relieved—not because there has been any change in the basic reasons for rationing, if there were any, but purely because the politically minded administration realizes how the country has reacted to some of OPA's rulings, and to offset this national resentment the administration, through OPA, will order relaxation at the right time to gain the most votes. But we predict, too, that much of the public will not be fooled.

Tax Plan Not Mid-Continent's

LAST week the Changing Panorama page carried reference to a postwar tax plan and said that it had been outlined by the Mid-Continent Oil & Gas Association in a letter to the association's board, from which an inference would be drawn that the association had either originated the plan or endorsed it. As a matter of fact, the association neither has approved nor disapproved the plan, authorship of which is stated to be unknown, but has sent it out because it was worthy of study.

We are sorry that THE OIL WEEKLY made the statement that the plan had been outlined by the Mid-Continent Oil & Gas Association. It seems generally to be a sound plan and one to which much thought has been given. Naturally, however, the association is not in the habit of having its headquarters develop plans and then send them out to the directors. As a matter of fact, we are not aware that the association has ever offered a plan, although we believe that it could well afford to sponsor a sound one.

On the other hand, it is obvious that in some quarters the very thought of an oil association endorsing a tax plan would be all that would be needed to condemn it. This, of course, ought not be the case if patriotic, intelligent and honorable men, such as compose the membership of the Mid-Continent Oil & Gas Association, put their brains to the job of producing and offering a sound plan. But in some quarters ownership of property (which also connotes tax-paying ability and performance) and sound thinking are a stench in the nostrils of those who have used the tax payers' money to finance the most dastardly attempt in our nation's history to grab political control, and to change both the form of our economy and government.

Another Explanation Of Butadiene Delay

A SPOKESMAN for the beverage-alcohol industry is disturbed that alcohol that used to go into beverages at four bits a half-ounce now is going into synthetic tires at 60 cents a gallon. Conjuring up a bogy made of three blocs,

explanation is made why the petroleum industry was delayed in getting its butadiene plants operating. The farm bloc, the prohibition bloc and the international bloc, it is explained, all combined to throw grain into synthetic rubber.

An editorial in a liquor dispensers' journal, which has been published in advertisements to enlist the aid of the thirsty public, opines that the farm bloc, ever eager for more uses for farm products, immediately saw an opportunity. Aid of the prohibitionists was enlisted because the result is automatic prohibition. Interests seeking to insure rehabilitation of the Indies rubber plantations after the war were eager that alcohol be established as the rubber ingredient because its cost is six times the cost of the same ingredient made from petroleum. With all these powers at work, it is explained, WPB and the rubber administration could do no more than grant priorities for alcohol plants while petroleum plant building crews stood idle. All these pieces fit into a jigsaw picture that is not pleasing to the makers of alcohol, and still less to dispensers.

Others, Too, Sense Pipe Line Dangers

THOSE in the oil industry are not alone in sensing the dangers which might confront the nation if the United States government carries out its intention of acquiring directly foreign oil interests such as the building of the proposed Arabian pipe line implies.

Speaking before the Foreign Policy Association at New York recently, Herbert Feis, economic adviser to the State Department from 1931 to 1934, issued the following grim warning based on his knowledge of foreign affairs:

"If the government carries through its [Arabian pipe line] project this nation may find itself in the very center of a complicated struggle . . . This struggle might adversely affect all its foreign relations . . . The obligation of defending an important government property interest in that part of the world might confront us with a choice between national humiliation and the use of force."

The president and publisher of the Fort Worth Star Telegram, Amon G. Carter has written a letter of criticism to the publisher of THE OIL WEEKLY who has replied. Both letters are printed in full on page 65 of this issue.

William Boyd On PAW Policy

ELSEWHERE in this issue, William R. Boyd, Jr., chairman of the Petroleum Industry War Council, comments on various matters engrossing the attention of the oil industry. He points out some objections raised to turning back to state regulatory bodies the control of well spacing (with certain exceptions retained) and indicates that PAW might be faced with some difficulty if it gave back to Texas, for instance, some of the rights its regulatory bodies had before the war, while not giving those rights to some other states having no regulatory bodies, for instance, he says, California.

As a matter of fact no such inhibition controlled the powers that be in PAW when California oil men told PAW that if the industry in that state were to do the job assigned to it, a special plan was necessary there. We think that the Californians were right, and PAW evidently thought so, too, because California was given a special set-up and has done a splendid job to date. Boyd, in mentioning objections to what the industry in District 3 wants, might well have remembered the concession given California.

At this time the impasse between PAW and what we believe to be the majority of operators in Texas, lies in a difference of opinion as to whether a better job can be done with a reduction of PAW powers on well spacing, or whether a better job can be done with conditions as they are. We urge Deputy Administrator Davies to come to Texas and find out for himself what the attitude and reasons of the industry are.

In Scripps-Howard papers during the past week a story appeared which evidently involved an interview with Boyd. The general tone or conclusions of the newspaper story, however, was not in exact accordance with an interview with Boyd by THE OIL WEEKLY Washington correspondent.

World Conservation Agreement Needed

IN ITS annual report for 1943, Standard Oil Company (New Jersey) comments on a world oil policy, as follows:

"If after this war, any substantial part of the world is to enjoy a standard of living approaching that achieved in the United States, world production of oil must be greatly increased. World production of goods sufficient to provide such a standard of living will require vast quantities of oil for machines, power and transportation.

"There are, we think, two principal problems. One is to find more oil. The other is to establish sound, world-wide, conservation policies under law so that oil will not be taken from the ground wastefully.

"It is our view that government is properly concerned with conservation policy and that an international oil conservation agreement is desirable. In the United States similar problems of conservation and efficient use in the general interest have been met by the various producing states acting through the Interstate Oil Compact under the coordinating authority of the federal government. Competition between individual companies remains vigorous.

"It is our view that new oil resources are most apt to be found by free, enthusiastic, enterprising men. Governments have not only been unsuccessful in finding new resources but when competing with private companies have actually prevented the discovery of new resources.

"We believe that the United States should take the initiative, in colloboration with other oil-producing nations and eventually with all interested nations, in seeking an international oil conservation agreement. We believe further that the United States government should encourage American private enterprise, first by refraining from competing with private individuals and companies, and second by lending American enterprise diplomatic support where Americans are at a disadvantage in foreign countries by reason of foreign laws or practices."

PAO 11 Change May Come This Week

THERE is a strong possibility that within the week certain provisions of PAO-11 may be modified by the Petroleum Administration for War to an extent which will be pleasing to operators in District 3, who have been urging a modification of PAW spacing rules.

THE OIL WEEKLY certainly hopes that something is done because the attitude of PAW thus far in refusing to make a change in its spacing regulations has been very discouraging to the operators in the area which will be called upon to furnish most of the added supply of crude oil needed in the war effort.

gestion currently under consideration,

Rodgers Made Chairman,

tract consisted of 532 acres, for which

WASHINGTON ROUNDUP

WORKING steadily but quietly, British and United States officials last week made definite progress toward the devolpment of principles for the postwar handling of world oil problems but there were indications that some time would elapse before the results of the conference became known in detail.

Definite results of the conversations in the form of recommendations which will become the basis of discussion on the cabinet level are yet to be developed.

INDUSTRY'S ROLE—Meanwhile, the Department of Justice disturbed by garbled reports of what Attorney General Francis Biddle told Secretary Cordell Hull regarding the participation of industry representatives in the discussions, issued a formal statement that it had no objections to their attendance as advisors or consultants nor to the making of recommendations by industry, but had merely pointed out that industry development or carrying out of policies would be contrary to the anti-trust acts.

STRIPPER AID APPROVAL—On the home front, independent oil interests attacked OPA's handling of the crude-oil price problem in hearings before a Senate committee, while Stabilization Director Fred M. Vinson indicated that he would approve the OPA plan for subsidizing stripper-well production. The stripper-well price problem will be a major subject of consideration this week at the May meeting of the war council.

PIPE LINE DEAL "BEST"—Release of testimony taken by a House appropriations subcommittee in charge of the Interior Department supply bill disclosed that Undersecretary of the Interior Abe Fortas, at least, believes that PRC's contract for the Saudi Arabia pipe line is "one of the very best deals" the government has made.

SECONDARY RECOVERY—The hearings also developed that several agencies of the department are vigorously engaged in the development of secondary-recovery methods, much of the work being at the request of PAW.

TEXAS-CALIFORNIA LINE—Formal application for authority to construct the proposed West Texas-California oil pipe line was filed with the PAW during the week by Pacific Emergency Pipe Lines, Inc.

COMMITTEE POSTPONES HEARINGS—Plans have been perfected for hearings to be held by the Senate special oil committee headed by Senator Francis Maloney of Connecticut but the start scheduled for May 2 has been postponed for a week or more by agreement not to take testimony on the international situation until after the conclusion of the State Department's Anglo-American conference. First witness will be Secretary Ickes who has prepared a voluminous formal statement on the Middle East and the Arabian pipe-line project.

OPA Charged with Discrimination as Plea Is Made for Oil Price Increase

Charging that OPA has flouted requirements of the Emergency Price Control Act, representatives of independent oil producers last week urged the Senate Banking and Currency Committee to include a provision for a parity price for crude oil in legislation extending the life of the act.

An apparently highly sympathetic committee heard the operators' plea as presented by John E. Mayor of the National Council of Independent Petroleum Associations, Russell B. Brown, general counsel for the Independent Petroleum Association of America, and Emery Carper, independent operator and mayor of Artesia, New Mexico.

Primarily attacked was failure of OPA to consult with the industry regarding prices which it "froze," neglect to appoint an advisory committee from the industry, evasive effort of OPA to develop other methods than an increase in prices to alleviate the situation, and delay in giving any consideration to needs of the industry.

It was asserted, and agreed to by committee members, that Congressional intent in the act was that OPA should advise and consult with industry with regard to regulations or orders which it issued.

"This has not been done as to petroleum producing," it was declared by Brown. "Since the act became effective no hearing has ever been held. An industry advisory committee on crude prices was appointed but did not function and no acknowledgment was made of the communications which the committee submitted on oil prices."

Hostile Attitude

All this, he said, was admitted by former Administrator Prentiss M. Brown before a Congressional committee in May, 1943, but no steps ever were taken to correct the situation.

"The attitude of OPA has, in fact, been one of hostility to all who sought to show the need of expansion of crude-oil production and the essential character of price in procuring such expansion," Brown charged.

With charts prepared in PAW and in his own office, Brown showed how oil prices have failed to keep pace with costs, the relationship between oil price and oil exploration and the almost-consistently downward trend of oil discoveries and new wells over the past few years.

"It is our contention that OPA has never attempted to see the oil industry as an entity, but as a series of scattered and isolated fragments," he said. "One agency was created by executive order and perpetuated by Congressional appropriation to coordinate the activities of the industry and to fuse its efforts in the common national undertaking; that was the Petroleum Administration for War. OPA's approach to its petroleum responsibilities was exactly the opposite; the producing industry to OPA was not a coordinated whole, responsive to the same influences and economic factors, but a multitude of oil fields and oil producers who were to be dealt with singly.

"We have in the OPA today a peculiar condition. There is the rationing part of the agency working desperately to cope with a deficiency of petroleum supply by dividing into ever smaller portions the amount which remains after military program needs have been met. Another part of the agency is and has been busy attempting to justify a policy which has prevented the expansion of activity that would lead to increase in supply."

Brown told the committee that none of the suggestions thus far put forth by OPA for "relief" of the industry will meet the situation adequately. The sug-

gestion currently under consideration, providing a subsidy for stripper well production, he said, will do no more than tend to maintain some wells which otherwise would be abandoned—it will not increase the supply of oil by a single barrel.

OPA during the week defended its position, when Administrator Chester Bowles wrote a letter to Ralph T. Zook, president of IPAA, who had written a protest to President Roosevelt of the difficulties which he said certain government agencies are raising against the industry.

Bowles declared that the crude-price ceilings on the basis of October, 1941, "represented a higher average price than any previous yearly average for the preceding 10 years," and called attention to the fact that in the past 2 years OPA has "increased this average price approximately 2 cents per barrel."

The administrator challenged the charge that the price of oil has been below the cost of replacement, although he admitted that replacement cost never has been determined. It is more significant, he asserted, that the controlled price of oil has "been accompanied by the greatest wildcatting activity and the lowest well abandonments in 10 years."

Bowles denied flatly that the industry had been denied the right to file petitions for redress of price, that OPA has reversed its formally-announced position with respect to procedure, has delayed decisions on petitions, or has discriminated against oil.

"I wish to make it clear that this office is mindful of the constitutional limitations imposed upon either legislative or administratve action under the Bill of Rights," he wrote. "So long as this agency provides price ceilings which make it possible for the industry to operate on a more profitable basis than that on which it operated in peacetime, and so long as we permit, as we always have, the industry to file either formal protests and petitions or informal requests for price increases, I am unable to understand the line of reasoning which leads to the conclusion that property has been taken for public use without compensation and that industry has been deprived of its right to petition.

"It is my belief that the oil industry, in all departments, has fared unusually well under price control. Available figures not only indicate the greatest profitable crude-oil production in the history of the oil business (with only one tenth of one percent reduction in estimated reserves) but also show that the refining and marketing segments of the industry have steadily improved their profit position."

During the week, also, it was disclosed that Administrator Ickes had placed the onus for the present situation on OPA, telling a House appropriations subcommittee that, in holding that a price increase would be inflationary, "OPA failed to take into account that when we began to fix prices, oil was out of line.

"We have never been able to have that recognized, or paid any attention to," he said. "We appealed to Judge Vinson and he turned us down. We asked for reconsideration and we were turned down again."

Ickes strongly defended the large producers against a charge by Representative Ben F. Jensen of Iowa that they were "dictating to" OPA.

"I do not agree with that," he declared. "When we organized the war council nearly three years ago with respect to price, there were undoubtedly two very distinct groups — the big, integrated companies knowing they could make money whether the price was higher or lower, generally speaking, who were opposed to a higher price, and the independents, particularly the small fellows from Oklahoma and Texas, who, from the very beginning, wanted to have a higher price. I remember that price fight was led by Frank Phillips, although he is not particularly small, but he did represent those interests."

Outlining what followed, Ickes said that PIWC finally came out with a unanimous vote for an increase in price. The charge that the big companies thwarted efforts for a price increase has been repeated and, he said, "the big fellows are getting pretty mad about this. They do not like to make a unanimous assertion for an increase in price and have it ignored.

"I think they are genuinely and sincerely in support of the higher price for crude oil."

Asked by Jensen if a 35-cent increase for stripper wells would produce more oil and more gasoline than the Army's Canol project, Ickes said, "as a rough guess, I would say so, and I would say that is not boasting very much."

Rodgers Made Chairman, Klein President of Texaco

W. S. S. Rodgers, president, has been elected chairman of the board of directors of The Texas Company. He remains as chief executive officer of the company. At the same time it was also announced that Harry T. Klein, executive vice president and general counsel, was elected president of the company.

H. T. Klein

R. L. Saunders, secretary was elected a vice president, and O. J. Dorwin, former associate general counsel, was elected general counsel.

Says New Naval Reserve Would Aid Some Companies

Charges that "some oil companies" are seeking to have the Navy Department keep its flying field at Norman, Oklahoma, as an oil reserve so that they may secure a lease and drill it for speculative purposes were made by Senator Elmer Thomas of Oklahoma during hearings on the Navy's 1945 appropriation bill, it was disclosed last week with release of the testimony.

Thomas explained that the department acquired more than 500 acres for the field, on which about $150,000 had been spent when oil was discovered in the vicinity and the numerous derricks which were erected made it unsafe for flight training.

Secretary Knox then proposed that the land be returned to the original owners for the price paid them plus the $150,000 expended by the department and bills to that end were introduced in the House and Senate. The legislation was referred to the Budget Bureau where, Thomas alleged, it has been held up for some months.

Department records showed that the tract consisted of 532 acres, for which a total of $46,431.60 was paid under condemnation proceedings. Upon the discovery of oil in the vicinity, one oil company offered $250,000 in cash and a one-sixteenth royalty, which it estimated would return another $500,000, but the Secretary felt it would not be fair and equitable for the government to take advantage of its power of condemnation to profit by the discovery of oil.

Disposition of the Moore field was considered by the House naval affairs committee April 27, with Representative Melvin J. Maas of Minnesota, ranking minority member, opposing the return of the land to the original owners.

Maas contended that the government should retain title to the land and lease it for oil development.

Officials Again Testify As to Pipe Line Benefits

Construction of the proposed Saudi Arabia pipe line will be to "our ultimate national benefit" and will avoid international squabbles, PRC President Ickes told a House Appropriations subcommittee during hearings on the Interior Department supply bill for the fiscal year 1945. This was released last week as the special Senate committee investigating oil held more executive sessions.

Ickes discussed the Arabian situation with the committee, but it was off the record and did not appear in the transcript. An outline of the agreement was given by Under Secretary Abe Fortas, who said "I believe on the financial side it is one of the very best deals that the government has made, within my knowledge," explaining that the estimated life of the pipe line will be 60 years or more, while its cost of construction, plus interest, plus the operation and maintenance, and plus a net profit, is to be returned by the companies within the first 25 years, after which the government will derive a large profit from its operation.

The Saudi Arabian situation also was discussed by William E. Wrather, director of the Geological Survey and a member of the mission which recently visited the Middle East.

"There is an enormous reserve of oil in the Near East which has been depleted very slightly to date, and the oil that has been developed in that region has resulted from a limited amount of wildcatting; far less than we are accustomed to in this country," Wrather said. "I think the potentiality for the future is tremendous."

Dow Assistant Director

Fayette B. Dow, director of the division of petroleum and other liquid transport of the Office of Defense Transportation, has been appointed assistant director of ODT in charge of liquid transport.

In charge of petroleum transport from the inception of ODT, Dow served as assistant to the late director Joseph B. Eastman from January, 1942, to the spring of that year, when the division of petroleum and other liquid transport was established and he became its director.

Funds for Department of Interior Cut by Group

Making cuts all along the line, the House appropriations committee last week recommended that $87,672,580 be provided for operation of the Interior Department during the fiscal year beginning next July 1, $9,151,627 less than recommended by the budget bureau and

$26,279,496 under the appropriation for the current year.

In its report, the committee paid tribute to the war work of the Bureau of Mines, which it declared probably has been engaged more actively in the war effort than any other bureau in the department, in recognition of which few substantial reductions in the estimates were recommended.

The committee cut another $14,000 from the estimate, already reduced $21,000, for administration of the Connally hot oil act by the petroleum conservation division, recommended $200,000 against $235,000 for this year.

It chopped $30,000 from the $530,000 estimate of the General Land Office for surveying public lands, allowing $500,000 against $524,000 this year, but allowed an $8500 increase for the registers, for which $95,000 is provided.

An increase of $82,000 for the work of the Geological Survey in minerals on public lands and naval petroleum reserves was approved.

In dealing with the Bureau of Mines, the committee cut $7640 from a proposed $39,260 increase in the fund for oil and gas investigations, allowing $600,000 against $568,380 this year; increased a proposed $100,000 cut in the fund for protection of mineral resources and facilities by $50,000, allowing only $250,000 against $400,000; and reduced a proposed $29,300 increase for care of buildings and grounds at Pittsburgh by $8100 allowing $160,000 against $138,800.

PIWC to Discuss Subsidy Plan for Stripper Wells

Stripper-well subsidies, proposed by the Office of Price Administration to Stalibilization Director Fred M. Vnson last month, will be the major subject of discussion at the May meeting of the Petroleum Industry War Council, which will have before it a memorandum from Vinson to PAW in which he says "the method of selective premium payments has much to recommend it," indicating that the proposal will be given his approval.

Vinson pointed out that the OPA recommendation requires a minimum of administration, can be expeditiously effectuated and will not change present industry practices.

Against this plan, he said, "refinery absorption of crude price increases is not only impossible in all cases but constitutes inequitable treatment under certain circumstances" while, on the other hand "a general crude increase with comparable product-price increases is believed inflationary and not justified by industry figures."

The proposal calls for a premium of 35 cents per barrel above existing maximum prices on oil purchased in fields averaging less than 5 barrels daily per well last year, 25 cents in fields averaging 5 to less than 7 barrels, and 20 cents in fields averaging 7 to less than 9 barrels. In Pennsylvania grade fields where wells average about ½ barrel daily and production is largely by secondary recovery, the premium would be 75 cents per barrel.

Fields in which output is artifically restricted below capacity by proration or other methods are automatically eliminated from the provisions of the proposal, but once a premium is authorized in any field it would be continued even if the average production per well rose above the figure on which the premium was based.

International News Photo

Representatives of Great Britain and the United States have begun discussion of world petroleum problems in Washington. Shown are (left) Charles Rayner, petroleum adviser of the State Department and chairman of the United States representatives, talking with Sir William Brown, KCB, KCMG, CBE, chairman of the British group.

Principles to be Applied to Postwar Oil Discussions Held Satisfactory

Negotiations between United States and British officials over the principles to be applied to postwar development of world oil resources are nearing a conclusion, said by American representatives to be "highly satisfactory," and the meetings are expected to wind up this week with the writing of recommendations to be submitted to high officials of the two governments as the basis for further conversations.

Broadly speaking, it was explained, the conferees have tried to take the general principles of international cooperation expressed in the "Atlantic Charter" and apply them specifically to oil problems. However, it was learned, the negotiations went further than mere generalities and specific projects in all sections of the world were discussed from the post war angle, although nothing was taken up that had any relation to military operations or the war.

The rapid progress made by the meetings was pointed out as evidence of the spirit of cooperation in which the British and American negotiators met. In general, there were few differences of opinion on such basic ideas as conservation, curbs on monopoly and imperialistic exploitation and the outlawing of cartels. There was no discussion of the Saudi Arabian pipe line and it was indicated that the most consideration which would be given the project in any event would be to talk over its importance in the postwar picture.

The diplomatic negotiations which may be necessary to secure permission to run the line through British-controlled territory in Trans-Jordan and Palestine, it was pointed out, would be a matter for the State Department and corresponding officials of the British government, and not for a general international conference on principles.

It is expected that several days will be required for the detailed work incident to the writing of a report and recommendation but that the entire conference will be concluded this week.

During the week, the Department of Justice clarified its position on the participation of industry members in the international discussions, apparently motivated by reports that it had ruled that such activity would be contrary to the anti-trust laws.

In a formal statement, Attorney General Francis Biddle said the department has never taken the position that consultation by any industry committee

with the government violates the anti-trust laws, but had made it clear to both the State Department and PAW that it has no objection to the formation of an industry advisory committee in connection with the inter-governmental discussions.

The department has neither been consulted as to the membership of any such committee nor expressed any view as to whether a committee is or is not desirable, has not said that the members of the committee could not take part in discussions, nor that they cannot volunteer any suggestions or criticisms, he said.

Biddle pointed out that his letter to Secretary Hull merely iterated a position adopted three years ago when the matter was brought up by the Office of Production Management.

Formal Application Filed for Pipe Line to West Coast

Application for authority to construct the proposed oil pipe line from Monahans, Texas, to Beaumont, California, was submitted to PAW April 26 by Pacific War Emergency Pipe Lines, following several visits to Washington by officials of the company for the purpose of conferring with government representatives who will have to pass on the matter.

The application was presented by Angus Wynne, president; L. M. Glasco, secretary-treasurer, and Jerry D. Hawkins of Dallas.

The proposal calls for a 9860-mile 20-inch line with a capacity of 200,000 barrels of crude daily, to cost $47,000,000. The application showed that the project could be carried through with private capital, but that there is no reason why it could not be financed by the government, if it was determined to handle the line as the big-inch and little-big-inch were handled.

Construction of the line has been given the support of the Texas Railroad Commission which, in a letter to Glasco, pointed out that in the Permian Basin an output of 597,203 barrels daily is available from 119 West Texas fields which, as of April 8, had a net allowable of 380,073 barrels daily, leaving a balance "available without physical waste" of 217,130 barrels. The commission said also, that indications of the area are that it may have an eventual production equal to if not greater than the East Texas field.

PAW officials had no comment on the project, but it was learned that several factors will be involved in its consideration, in addition to the questions of desirability of the line and the supply of materials needed for its construction.

A major factor of consideration will be the actual availability of oil from the Permian Basin at the time the line would be completed, in view of the increasing use now being made of sour oil in District 2, where it is expected that the use of West Texas oil will reach the present production potential by the end of the year through the conversion of catalytic cracking units for its processing. Some 40,000 to 50,000 barrels daily already are being used in the district.

While West Texas interests have pointed to the successful wildcat activity now going on in the area as a promise of materially increased output, the question has been raised as to the availability of material.

Position of PIWC on Foreign Policy And PAW Matters Discussed by Boyd

Questions regarding the position of the Petroleum Industry War Council on subjects which currently are engrossing the attention of the oil industry were discussed last week by William R. Boyd, Jr., chairman of the council.

Specifically, these questions have to do with foreign oil policy, PAW regulations and PAW appropriations.

Boyd was emphatic in pointing out that PIWC has never adopted any official attitude toward PAW's foreign policy, for the reason that the petroleum administration itself never has developed such a policy, and that the only discussion of that subject has come from the foreign operations committee in the form of a report which never has been given the approval of Administrator Ickes.

The council has, however, he pointed out, adopted a resolution condemning government invasion of the oil industry, as indicated in the proposal of Petroleum Reserves Corporation to construct the Saudi Arabia pipe line, and supporting recommendations of the foreign operations committee with respect to a national foreign oil policy, although no action was taken on the committee's recommendations for the machinery to put that policy in effect.

Approved were the committee's recommendations that the oil resources of the world can best be developed by private enterprise under a free economy; that a foreign oil policy should be established by this country at once; that such policy should involve strong government support to our nationals operating abroad; that the government should not participate, directly or indirectly, in the ownership or operation of foreign properties, and that the report of the committee was "a sound and constructive presentation" of the PIWC special committee on foreign oil policy.

Not acted upon was a proposal for an international oil compact.

With a view to clearing up misconceptions which appear to be held in some quarters, Boyd explained that PAW is not a foreign policy-making organization, and that the PRC pipeline proposal has no connection with the activities or aims of the oil-control agency beyond the fact that the same official heads both bodies.

The council, he said, has not been consulted regarding foreign policy either by PAW, PRC or the State Department, although members of the council are on the advisory and consultative group set up by the department for the current Anglo-American conference. Whether the proposals before that conference are proper subjects for PIWC remains to be seen, he added.

It was also explained that the council's failure to act on proposals for the revocation of PAO-11, relating to well-spacing, was due to a lack of the complete information which the PIWC demands as the basis for unanimous action. As is known through the industry, the matter came up at the April meeting of the production committee and was carried to the floor of the council, where it was referred back to the committee with instructions to make a further study and submit recommendations at the May session.

While the council has not acted, Boyd pointed out that there are a number of factors which must be considered in consideration with proposals for revocation of the order. There is the question, he said, whether it could be revoked with respect to Texas and other states having oil-control agencies who could enforce well-spacing regulations, without vitiating it with respect to other states, such as California and Illinois, which have no regulatory bodies.

There also is merit in PAW's argument in opposition to revocation, based on the fact that PAW is the claimant agency for oil labor and materials, a status is gained from the War Production Board only after long argument, and it is feared that if PAW's authority was delegated to the states the WPB would immediately rescind its grant.

Whether the matter will come up at the May session, in view of the inability of Deputy Administrator Davies to go to Texas for discussions, is in some doubt, but it was said it will eventually come up and will be acted upon.

Beyond this, Boyd said, PIWC has not considered the matter of PAW activities. The council is solidly behind PAW and feels that the industry could not operate without it under present conditions, but has not concerned itself with organization or finances. So far as the agency's expended budget is concerned, he said, the council feels that that is a purely government matter and not one in which it should take any position.

Texaco Stand on Arabian Pipe Line Is Outlined

The proposed Arabian pipe line is of such great national importance that it should be settled not by the oil industry but "by those in authority who are entirely neutral and have only the welfare of the American people at heart," W. S. S. Rodgers, president of The Texas Company, said at the company's stockholders meeting recently.

"In my opinion," he said, "this question transcends not only the interests of the companies involved, but also those who feel their interests might be adversely affected. Furthermore, I feel very strongly that the decision should not be unduly influenced by publicity emanating from interested companies."

Summarizing the position of his company, Rodgers went on, "We believe that the proposed line is sound economically and should be built. Second, it does not constitute entry of the government into the oil business. Thirdly, our oil reserves in Saudi Arabia may be regarded as an insurance policy if in the future there is a shortage of petroleum in this hemisphere, as predicted by numerous authorities in the government and industry. Fourth, the government's action is justified because the proposed line traverses several mandated countries and international relations are involved. Finally, the action is justified from the viewpoint of diplomatic relations."

IPAA Sees Government Attitude Threat to National Security

Oil production of United States to prove sufficient for future needs if Washington changes views, permits free enterprise and makes plain it will not enter oil business

By WARREN L. BAKER, Editor

STRONG attacks against the way the government is handling oil affairs were made at the mid-year meetings of the Independent Petroleum Association of America and the National Stripper Well Association, at Bradford, Pennsylvania, last week. The present attitude of the government toward oil was held up as not only constituting a threat to the industry but as a threat to the national security of the United States.

It was asserted that oil production of the United States can be stimulated sufficiently to assure an adequate future supply only if the government changes its attitude so that: domestic operations will not be restricted while foreign operations are encouraged to increase; continuation of a highly competitive free enterprise industry is assured; the necessity of high crude-oil prices to keep stripper wells operating and encourage application of secondary-recovery programs is recognized; a definite policy assuring that the government will not directly or indirectly engage in foreign or domestic oil ownership or operation is established.

In a vigorous attack against the proposed Arabian pipe line, Ralph T. Zook, president of the Independent Petroleum Association, termed its threat to national security so serious as to be of paramount interest to "every citizen of the United States."

This pipe line, Zook said, would plunge the United States into "the hot bed of centuries-old disputes, would more than likely cause future wars, and is a move toward fascism," because it marks the entry of government into the oil business.

Compares Cost

Building the pipe line, he continued, "could lead to a permanently depressed domestic oil industry which, in turn, would threaten the safety of the country in the event of future wars." Iraq and Iran, he said, could not stand by and see Arabian and Bahrein oil going to market in large quantities, so "the laying of this pipe line can bring on the market an additional 600,000 barrels of crude oil daily, raising the total production of the Middle East to one million barrels daily. If the European and African markets cannot absorb this additional 600,000 barrels, then this oil will be knocking at the door of the United States on a competitive basis which will freeze the price of our domestic oil at not above and perhaps below the present level."

Zook declared that Arabian oil can be delivered at New York at a cost of $1.47½ per barrel compared with $1.61 per barrel for East Texas oil, which gives Saudi Arabian oil an edge of 15 cents per barrel over East Texas oil delivered at New York. Any refinery will find 15 cents per barrel additional margin most attractive . . . this 15 cents could very readily become 50 cents through elimination of the import tax and profit, and the independent domestic producer would be forced out of business even more rapidly than under today's conditions, he contended.

"No one has said that the oil reserves of the Middle East should not be developed. However they should be developed through private enterprise and private initiative, backed by a strong United States diplomatic policy."

Laying of a pipe line across Arabia will not make one more gallon of oil or gasoline available, Zook continued. In this connection he pointed out that the Arabian and Bahrein oil now are available to markets on the shores of the Persian Gulf, and that the people of the United States are financing a huge fleet of ocean tankers which will be available at the close of the war for movement of oil from the Persian Gulf or any other part of the world. "Pipe line construction of the type planned," Zook said, "would render idle a part of this tanker fleet, already financed."

Zook offered the following ideas as representing the belief of the association:

1. That the United States government should establish and maintain a consistent foreign oil policy by (a) giving necessary and legitimate diplomatic support under the principles of international law to its nationals engaged in foreign oil operations; by (b) fostering private enterprise of its nationals in foreign exploration, production, transportation, refining and marketing of petroleum and its products; and by (c) establishment of a cardinal principle in such foreign oil policy that the government itself will not directly or indirectly engage in foreign oil ownership of operations either in a sovereign or proprietary capacity, or through ownership in corporations or other agencies.

2. That if the Arabian pipe line is justified by economic conditions, it should be built and owned by the companies. If it is not justified on an economic basis, then it should not be built.

3. That no shipping space needed to carry on the successful prosecution of this war and no equipment needed in connection with the production, refining or transportation of petroleum in the United States should be used in the construction of this line or any similar one.

Sandefer Speaks

If abandonment of reserves under stripper wells were only a personal problem of the oil producer, "then our nation should probably not be interested," said J. D. Sandefer, Jr., president of the National Stripper Well Association, "but when the nation is running short of oil to power the war and its domestic machinery, then it should become of great concern to our people."

Sandefer pointed out that engineers had estimated "1,400,000,000 barrels of oil can be produced from small wells producing today under primary methods," and "2,600,000,000 barrels can be produced by secondary-recovery methods. Thus, when we talk about strippers and secondary recovery we are shooting at nearly 3 billion barrels of oil, or reducing this figure to a simpler total, enough oil to run the war, and our nation, for nearly two years."

Sandefer announced that incomplete figures covering stripper wells showed "more wells were abandoned in 1943 than ever before. Under these wells lie many barrels of oil that this country needs. When these wells are abandoned these reserves are lost forever in most cases, because the price of crude oil would have to be three times what it is now if these reserves are to be redrilled . . . All wells cannot receive a price that will always keep them alive, but when wells are abandoned that could produce secondary-recovery oil when we need it so badly, I feel that it compares with a war plant that is not allowed to produce its maximum of planes, shells or ships.

"Application of secondary recovery to stripper wells is largely an economic problem. I am of the opinion that we have advanced further in the technical side of the problem than we have in the economic side. The cost of secondary-recovery oil is small compared with the value of extra oil produced, and it is a sad state of affairs that the price of crude oil is so low that it will not support the application of the best technology in the production of oil under the present crude oil prices, the use of secondary recovery being denied to most of the Southwest, and in other sections of the United States . . . secondary recovery becomes automatic when the price is sufficient."

Correctives Resisted

Some conditions exist in government which oil producers must have removed if they are to function effectively in pro-

viding enough oil, according to Russell B. Brown, general counsel for the Independent Petroleum Association, in speaking on the subject of "What We Should Expect from Government." "Some of the conditions we wish removed were created by persons in government and these same persons will not remove the conditions voluntarily," he said, "they will remain until acted upon by outside forces, and there will be resistance of the application of correctives acceptable to the industry.

"We are now in an era of great confusion and in the postwar we may expect difficulties in returning to the freedom of opportunity which is inherent in our original, undistorted form of government. Some of the difficulties will be due the magnitude of the task and some will be forced upon the people by that group who see in this war the opportunity they have long sought to make over the form of government and the structure of our society. There is much planning under way, and while the greater part of it probably will come to nothing, some of the schemes for subordinating domestic development in favor of oil development in other nations will have to be combated in the open, when and if they emerge. I think some of these plans will be brought out, beautifully packaged and labeled as conservation measures. That word will be used to describe practically anything, from shutting in domestic production to building pipe lines in Arabia.

"The principal problem of oil currently is supplying the war effort, and we have the right to expect a greater degree of realism on the part of government . . . than we have had to date. There has been no policy on the supply end of petroleum except that of restriction."

Federal Land Ownership

A retarding and discouraging influence upon the industry is the compounded confusion in Washington, Brown said, where "every one of the cabinet departments except the post office has something to do with oil." Several of these, he warned, appear to have plans to "settle down and continue in the oil business," including the Army and Navy. "As to petroleum," Brown added, "it is not government, but a series of governments, more or less independent of each other and frequently in violent conflict, with which we are expected to deal . . . We must insist upon some simplification of the condition which now exists in the government as to wartime regulation of petroleum."

Recent additions to the federally-owned lands was held up by Brown as offering another impediment to exploration and development, and a threat of government oil ownership in the future. He said that in 3½ years, more than 12 million acres were acquired by 23 federal agencies and pending transactions at the end of 1943 would add 18 million acres more. Furthermore, one agency now reserves three-fourths of the mineral rights under tracts it sells to private owners. Much of this land is in oil-producing states.

Implied in some of the government planning on petroleum is that of large-scale foreign oil exploration, enlarged refining capacity, higher importation of foreign oil, and even a reduction of tariffs, Brown said. Plans for expanded drilling, production and pipe line abroad are to be found, he said, in PAW's request for increased funds, while lower tariffs is part of the master agreement on lend-lease. Brown asked that oil men ponder these thoughts on foreign operations and "see whether you arrive at the conclusion that there is more to this consistent bureaucratic stand" than appears on the surface. Congress must be our principal hope for alleviation of present critical conditions and averting of future disaster, he concluded.

Oil an American Epic

From Governor Edward Martin of Pennsylvania the gathering heard a plead for continuation of free enterprise and a warning that while it appeared we will win the war at the battle front that we may lose a war we are fighting at home. "Individual initiative made this the finest and strongest country under the sun. I sincerely believe the salvation of America depends upon maintaining free enterprise at home," he said.

Turning to the oil industry, which he held up as an American epic, Governor Martin said that incentive was one of the things that would give the nation an adequate supply of oil. "Men take chances and work harder for a profit. This may be in the form of better wages or a return on vested capital. Since Americans work by the incentive plan, there is only one way by which oil production can be stimulated—that is by an increase in price . . . an increase in price is necessary to keep up production. We must depend upon private enterprise for our production. Subsidies for oil or any other commodity is not sound governmental policy."

A series of papers on secondary-recovery methods were presented as part of the program. In one of these, Arthur C. Simmons, geologist and petroleum engineer of Bradford, declared that the proper and accurate estimation of secondary water-flood costs was as important as accurate estimates of recoverable oil. In estimating cost it is essential, he declared, to include all items to prevent economic failure. He suggested that total or overall costs be sub-divided into three principal divisions: land, development and operating costs.

Because oil reservoirs are made up of rock formations consisting of several strata of widely differing permeabilities, water sometimes breaks through the more permeable sections. In such instances, S. T. Yuster and J. C. Calhoun, of Pennsylvania State College, said water-oil ratios may become so high that it is impractical to continue flooding even though yield of oil from the less permeable sections may be of economic proportions. Under these circumstances, the authors said it would be highly desirable either to shut off or reduce the overall conductivity of the higher permeability strata. This would mean the postponement of abandonment of the property, the conservation of a national resource, and the continuation of a profitable production. They discussed several methods that had been tried. One was the use of a new treating compound developed in the research labaratories of Pennsylvania State College. This compound is a colloidal dispersion of a solid in water and has been successful in laboratory tests, and some field tests have shown promising results.

The greatest practical net return is realized from any water-flood project only when the development and operation are planned and carried out in accordance with the specific requirements of the sand body underlying the property concerned, said Harry M. Ryder, Ryder-Scott Company, Bradford. The determination of the requirements of a specific sand body, he said, is strictly a problem in reservoir engineering.

Indications are that the time is not far distant when a large portion of the air-drive production can be flowed with considerable saving, according to R. B. Bossler, Brundred Oil Corporation, Oil City. He described experiments in flowing wells located on leases being repressured with air or gas. Important savings can be achieved by the reduction of the ration of gas input per barrel of oil produced, and while it is yet to be proven, he said a greater ultimate production probably could be obtianed.

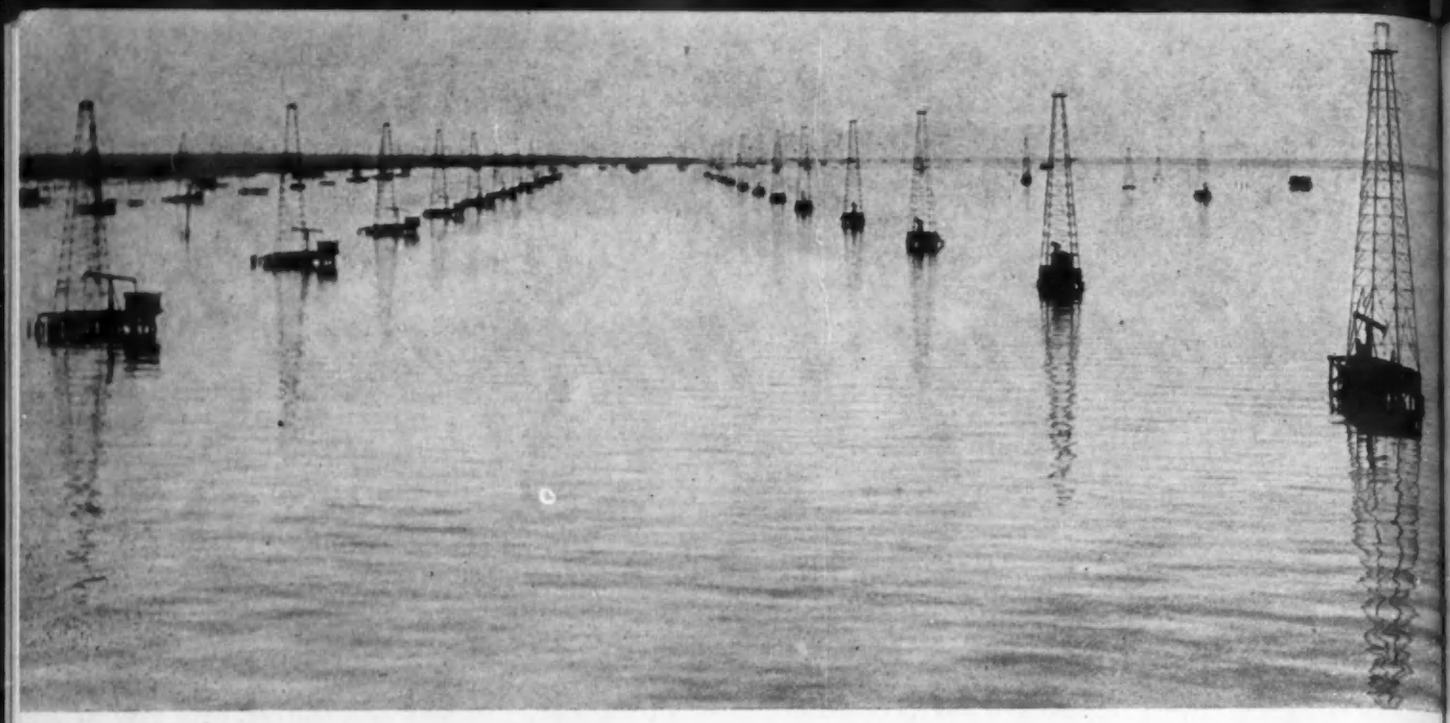
Three of the technical papers constituted a symposium explaining laboratory tests on oil sands in connection with secondary recovery. Porosity was described by Paul M. Phillippi, Forest Oil Corporation, Bradford, as the best known physical characteristic of an oil reservoir. It determines the volume of oil or gas present, and all recovery computations must be based on a knowledge of its value. The actual preparation, testing and calculation of porosity is routine work and can be quickly learned by an inexperienced operator. However, the application of these data and the interpretation of results demands the services of a technician versed in reservoir performance.

Saturation Measurements

Saturation measurements, according to Donald T. May, Ryder-Scott Company, Bradford, are made for either or both of two purposes: valuation or development and operation control. For the first purpose, any method which is approximately accurate and gives satisfactory averages usually is considered sufficient. For the second purpose, a high degree of accuracy for each individual sample, not merely an accurate average, is essential. Precision oil saturation determinations must accurately represent the oil content as it is in place in the sand body just prior to drilling. It is essential therefore that the sampling method be such that the sand can be cut and placed under laboratory control with the least possible change in its oil and water content. After describing laboratory procedures, the author said such procedures, carried out on all wells drilled in a water-flood project, are making it practical to profitably increase ultimate oil by 1000 to 3000 barrels per acre above that obtained without such work.

Permeability was defined by John DePetro of the A. C. Simmons Core Testing Laboratory, Bradford, as that property of a solid which makes possible the transport or conveyance of fluids by and through it, or the measurement of the fluid conductivity of a solid. Purposes of testing the producing sand for permeability in secondary-recovery were listed by DePetro as follows: Determine the permeability profile and average values; determine the floodable sand; correctly shoot the pay sand; fluid input capacity and rate; well spacing, and proper injection pressures.

Delivery Promises!
SPANG-CHALFANT
Division of The National Supply Co.
Executive Offices: Pittsburgh, Pa.
Sales Offices: Atlanta; Boston; Chicago;
Denver; Houston; Los Angeles; New York;
Philadelphia; Pittsburgh; St. Louis;
San Francisco; Tulsa; Washington.



Oil Derricks strung across the waters of Lagunillas field in Lake Maracaibo, Venezuela.

WHILE Venezuela has for some time been the scene of most active oil development in South America, several factors have combined to bring about the most intensive activity in the Lake Maracaibo area in the extreme northwestern part of the country.

The new Venezuelan petroleum law has served to eliminate many of the misunderstandings and uncertainties that until recently handicapped large-scale operations there. The oil industry in Venezuela is now going forward on a sound basis, both economically and in its relationships to the government and public.

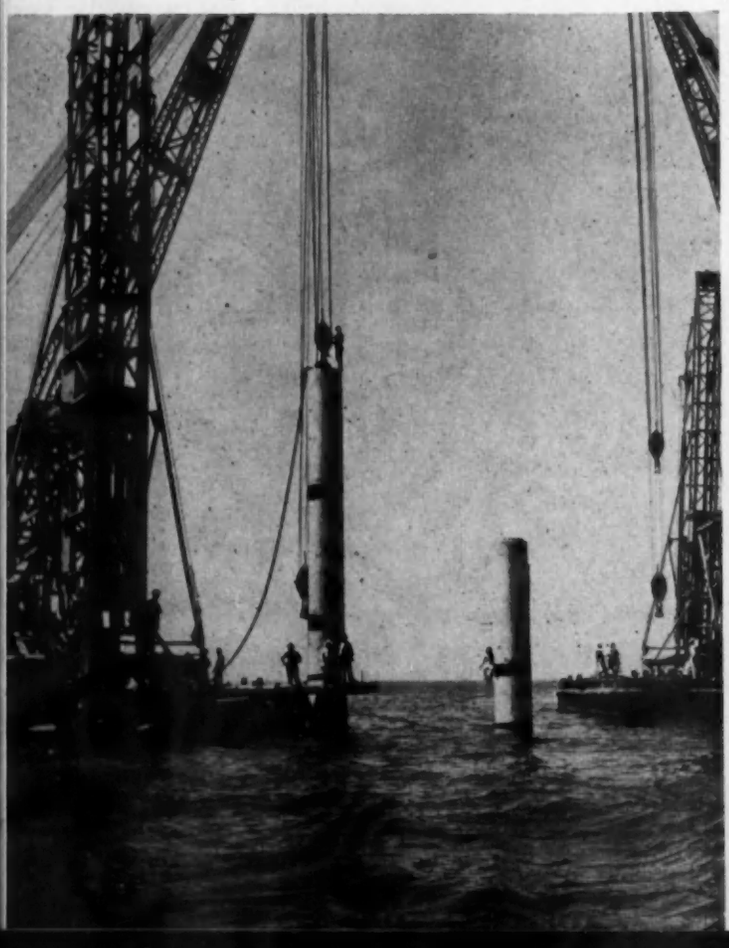
The active interest of the United States government in an increased production of Venezuelan crude oil to supplement domestic production is likewise being reflected in a well-implemented campaign to provide machinery, materials and supplies required for stepping up the rate of well completions there.

The specific factor that has led to greatest concentration of drilling activity in the Lake Maracaibo area, however, is the submarine menace that was all too real until recent months, and which was to a considerable extent responsible for the curtailment of production from fields in Eastern Venezuela. This situation existed during much of 1942 and 1943, and has persisted due to lack of adequate ocean tanker transportation to move the oil to refineries.

No such curtailment of production was necessary in the case of the Lake Maracaibo fields, since the yield from that area continued to move without difficulty to the nearby refineries on Aruba and Curacao by lake tanker across only a short stretch of open sea —in the case of Aruba, only 40 miles.

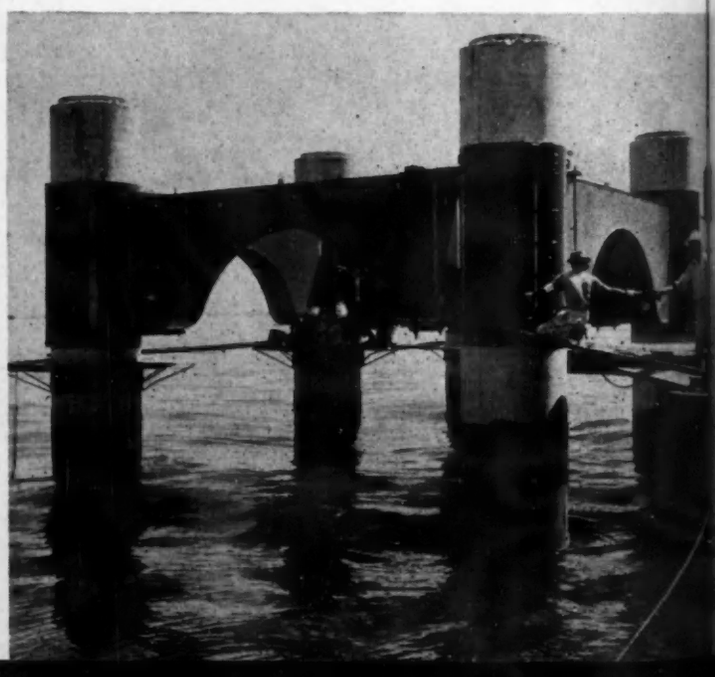
Some of the recent developments in the Lake fields are of much interest, not only because of the number and variety of drilling operations, but by reason of special engineering methods that have been developed for setting foundations for derricks and rigs out in the lake waters.

Aside from protection against corrosion and wave damage, the problem of constructing permanent foundations in the lake is enlarged because of the thick layer of silt at the lake bottom, which renders difficult the setting of footings that will remain stable and provide a level derrick floor.



(Left) Creole Petroleum Corporation starts a foundation for another well in Lake Maracaibo.

(Below) Twin wells will be drilled from this completed derrick foundation.



SET SCREWS for Return Bends

Temperatures run high in the return bends of oil-refinery piping systems. Here fastenings must stand up to difficult conditions of stress and temperature if the production of war-needed fuels for ships and planes is to be maintained.

Bethlehem is making large quantities of special heat-treated, hexagon-head set screws, in a wide variety of diameters and in lengths up to 9 inches, for use in return bends.

These dog-pointed, modified acme-thread set screws are machined from hexagon bars of SAE 4140, a chromium-molybdenum steel for service in a range of temperatures over 650 deg. F. To obtain exacting fit, points and threads are accurately machined before shipment.

Bethlehem's fastenings division is humming these days, turning out hundreds of types of standard and special fastenings for use in fighting equipment and in war-related applications on the home front, ranging from lag bolts and machine bolts to heat-treated alloy studs and other bolts for high temperature service.

However, we are not too busy to assist you, if you have a trying war-related fastenings problem. Write in detail about your difficulty to the nearest Bethlehem district office, or to Bethlehem Steel Company, Bethlehem, Pa. No obligation, of course.

★ BETHLEHEM STEEL ★

Utilizing Natural Gas Would Aid United States Oil Supply

Government could expend energies developing suggested process and thus lengthen domestic petroleum reserves and supply needed gasoline rather than giving so much attention to foreign fields

By SAMUEL F. PETERSON, Petroleum Engineer

DUE to the critical shortage of gasoline for civilian use, considerable interest is being manifested by the public in the development of synthetic fuels by the employment of the Bergius and the Fischer-Tropsch processes. These processes have been in use in England and Germany for a number of years, principally in developing liquid fuels from coal. According to Dr. H. H. Storch, principal physical chemist of the United State Bureau of Mines, Germany is producing approximately 31,000,000 barrels of synthetic gasoline annually. However, in this country nothing has been attempted with these synthetic processes on a commercial basis although of late considerable study is being given to this subject. One Fischer-Tropsch pilot or demonstration plant is now operating in this country and two more pilot plants are under construction.

Briefly stated the Bergius process is a direct hydrogenation of coal. It makes use of high temperatures and high pressures applied to the finely powdered coal paste to which hydrogen and a catalyst have been added. The Fischer-Tropsch is an indirect process using low pressures to convert coal and other fuels into synthetic oils. The substance processed is converted into synthetic gas and the catalytic conversion of this gas into synthetic petroleum, and finally the conversion of the synthetic petroleum into gasoline and other petroleum products.

There are three major resources in the United States from which fuels may be derived, other than crude petroleum. The order of their importance measured in amount of reserves is as follows: (1) coal, (2) oil shales and (3) natural gas. To give one an idea of the enormity of these reserves in this country, below is listed an excerpt of a table of mineral fuel reserves as of January 1, 1942, prepared by Dr. A. C. Fieldner, Chief of Fuels and Explosives Service, United States Bureau of Mines. These reserves are expressed in equivalent tons of bituminous coal of 13,000 Btus per pound calorific value.

3.2 billion tons of natural gas,
4.3 billion tons of petroleum,
21.0 billion tons of shale oil,
2559.0 billion tons of anthracite and bituminous coal and lignite.

Dr. Fieldner says that the above resources would have a life of several thousand years, based on the rate of consumption during 1941.

Natural Gas Favored

Natural gas is generally favored by the experts as the most desirable resource to process by the Fischer-Tropsch method to obtain gasoline. This preference for natural gas is indicated for the following reasons:

(1) Cheapest resource to process;
(2) Less steel is required for plant installations;
(3) Far less manpower needed;
(4) Can be utilized more quickly, as no mining is necessary, as for other two resources.

Some petroleum authorities believe that by using the Fischer-Tropsch process on a large scale for natural gas, that gasoline could be produced more cheaply than can be accomplished by present refining methods of crude oil.

It should be emphasized for the benefit of the layman, that there are two main sources of natural gas from which gasoline can be obtained. One source is dry, methane gas from gas wells which are not necessarily associated with oil, such examples being the gas deposits in the Hugoton gas field in Southwestern Kansas and the gas deposits in the Texas Panhandle. The other source of gas is casinghead or "wet" gas. This latter gas is in solution with the crude oil and is released when the oil wells are pumping or flowing. Gas from condensate wells found principally in the Gulf Coast region of Texas and Louisiana, as well as Arkansas, come under this category.

Let us first consider dry, methane gas. It has been variously estimated that we have a reserve of 85 to 125 trillion cubic feet of such gas in the United States. Petroleum authorities have testified that by means of the Fischer-Tropsch process, 5 gallons of gasoline can be recovered from each 1000 cubic feet of dry, methane gas. Processing 2 billion cubic feet of this gas daily therefor should obtain 10 million gallons of gasoline daily or approximately 180,000 barrels. The residual gas would approximate half of the original volume processed and would contain approximately half of the original heat content. This residue gas could be mixed with unprocessed natural gas and used as fuel.

Nearly 8¼ billion cubic feet of wet gas was treated for gasoline daily during the year 1942. Most of this gas was run through natural-gasoline plants. An average of 1½ gallons of gasoline per 1000 cubic feet of gas was recovered, and approximately 20 percent of the gas processed was returned to the formations to help maintain reservoir pressure.

There are at least 10 billion cubic feet of wet gas available daily for processing by the Fischer-Tropsch method, and the gathering lines are already laid from the oil wells to the new existent natural-gasoline plants Since approximately 4,400,000 barrels of crude oil are being produced daily from over 400,000 wells in the United States, probably considerably in excess of 10 billion cubic feet of casinghead gas are produced daily. A large amount of this gas is vented to the atmosphere, but it is looked upon by the industry and the conservation authorities as unavoidable waste. It is impractical to gather this gas from small, isolated oil pools and. of course, many oil wells do not produce a sufficient amount of saturated gas to justify connecting to them.

Much Gasoline Recoverable

Nevertheless, if 10 billion cubic feet of wet gas could eventually be proc-

■ CONTINUED ON PAGE 32

MILITARY PIPE LINES

The First Detailed Account of How These Portable Pipe Line Systems Are Constructed and Operated

...ds.

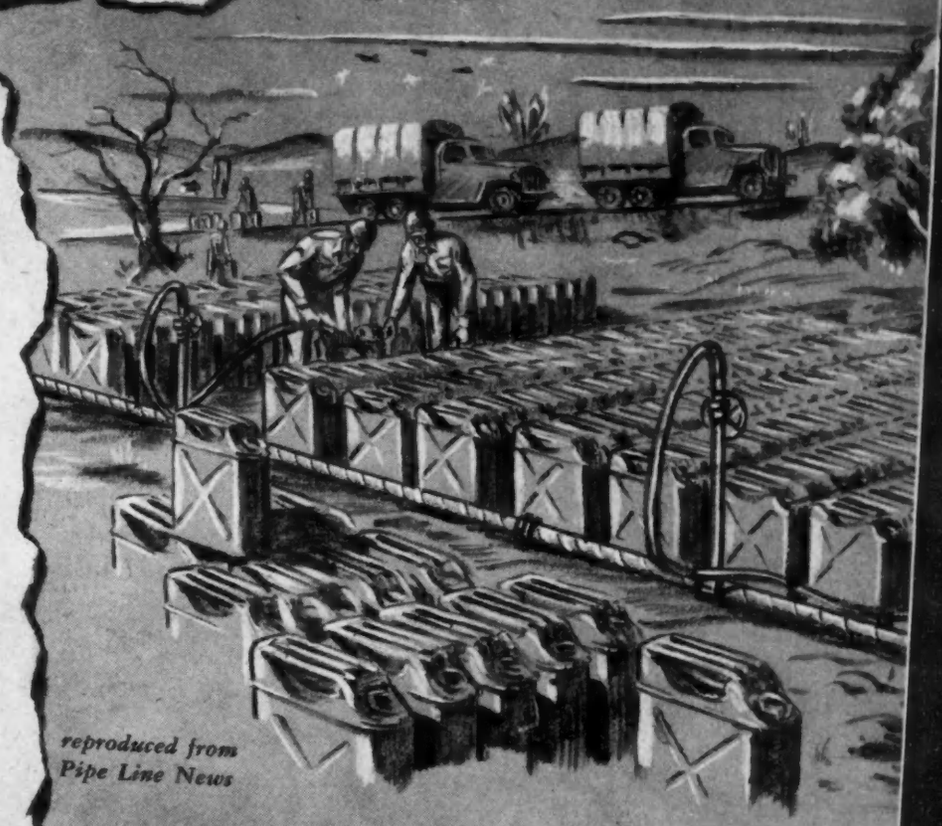
The small size pumping unit has a Gaso duplex piston pump, 4¼-inch bore by 6-inch stroke, driven by V-belt. This unit has a capacity of 200 barrels per hour, or 140 gallons per minute at 90 revolutions per minute and operates at a differential pressure of 200 pounds per square inch. The fluid end can withstand pressures up to 750 pounds.

The pump is powered by a six-cylinder Buda gasoline engine, rated at 96-h.p., under continuous load. This is about double the power required to operate the pump under normal load. Gasoline for the engine normally comes from the pipe line if gasoline is being pumped, by means of a double valve line from the top of the sand trap to a 45-gallon supply tank located under the engine hood, and from there to the engine by gravity flow. For either types of service, the engine is equipped with an electric fuel pump so that a gasoline supply can be taken from can, drum or underground storage where required.

The larger size of Gaso reciprocating pump also used has a 4-inch bore by 10-inch stroke, with capacity of 200-barrels per hour at 70-r.p.m., powered by a large Buda engine.

Centrifugal Pumps Used

...ifugal...



reproduced from Pipe Line News

here's where...

...Your GASO pumps are serving!

While realizing the inconvenience imposed upon you by our war commitments, both we and our men hope that you will find some satisfaction in the knowledge that the GASO PUMPS that would normally be serving you are helping instead to speed the return of your loved ones in the armed forces . . . Gaso Pump & Burner Mfg. Co., 902 East First Street, Tulsa, Oklahoma. Export Office: 149 Broadway, New York. Shreveport: W. L. Somner Co., 419 Lake Street. Los Angeles: Service Oil Field Supply Co., 5333 S. Riverside Drive.

GASO PUMPS

FOR EVERY OIL INDUSTRY NEED

Drilling Fluid for Completion Of Shallow Oil Wells

Favorable results of fluid other than water-base muds are indicated by many examples of good well completions but final evaluation must be deferred for further study

By W. H. FARRAND and W. A. CLARK,
The Texas Company, Los Angeles, California

Presented before spring meeting of the Pacific Coast District of the American Petroleum Institute, Los Angeles, California, March 23, 1944

IN THE past few years, many hundreds of wells have been drilled in California by the rotary method into zones having formation pressures as low as 50 pounds per square inch, and having permeabilities as high as 15 darcies. It may be stated that most of these were completed as producers, despite the method of drilling and the lack of pressure in the zones. Nevertheless, it may be debated as to whether higher initials could be obtained by using better completion methods and a proper fluid for drilling into the producing zone.

The majority of the wells were drilled and completed with water-base drilling fluid made from California native muds. Recently, however, considerable attention has been paid to improving the character of drilling fluids to lessen possible harmful effects on initial and settled production.

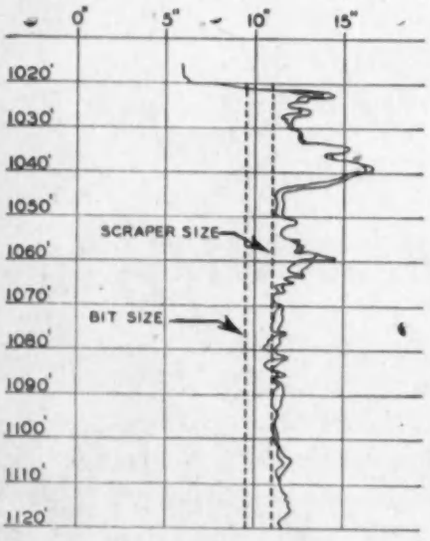
Special fluids, either to drill in with or for final completion of the well, have been used in an attempt to improve productivity. These fluids have consisted of oil-base fluids, bentonitic gel fluids, and chemically treated water-base muds.

Attention was directed to the possible harmful effect on low pressure sands of too heavily weighted muds which might force mud fluid into the sands. Consequently, the use of low weight—70-75 pound fluid is now considered the proper procedure.

With the use of water-base muds, the effect on permeability of the water filtrate seeping into the sands or the formation of a "water block" were taken into account. Rapid completion following penetration of the sand may minimize these conditions.

Thought was given by some that by the time a liner is run and the well completed, the effect on production of an excessively thick and perhaps impervious mud cake occuring on the face of the sand which could not be dislodged by the low pressure formational fluid, would be excessively harmful. This might be particularly true if very fine mesh perforations or gravel pack were used unless the annulus was thoroughly flushed.

On a well completed last year two runs of the hole caliper were made, the second run being five hours after the completion of the first run. This well was drilled with a good water-base mud in a highly permeable sand. Your attention is called to the thickness of the well cake deposited opposite the sands of the producing zone in this five-hour interval. This, of course, only shows the mud cake deposited. It is no measure of the filtrate water which must have penetrated the zone during this period of deposition of wall cake. See Figure 1.



SECOND RUN FIVE HOURS AFTER FIRST
NOTE WALL CAKE INCREASED THICKNESS

FIGURE 1

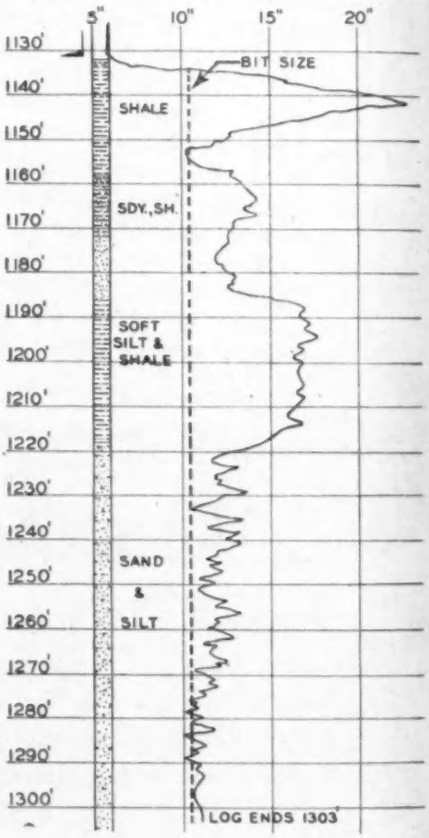
Water-Base Fluids

From laboratory data and some field experience, it is common knowledge that water, particularly fresh water, seeping into certain sands in some way impairs permeability which may result in a decrease in oil productivity.

A well in the Signal Hill field completed in the middle of 1930 for 80 barrels daily average for the first month gradually built up in production until in 1934 it averaged 130 barrels daily for a three-month period. There was no change in the producing method employed on this well yet gradually the production built up and water block in a tight sand is suspected as the cause, or reason, for the low initial production.

A well at Paloma was completed in sands of low permeability with water-base mud at rather a disappointingly low rate of 34 barrels daily, 47.8 gravity, 360,000 cubic feet. During succeeding weeks, production from the well rose gradually to a figure of 85 barrels daily, 54.5 gravity, 840,000 cubic feet, indicating an initial water block although another factor, gun-perforating, may have influenced the well's behavior.

One investigator has made laboratory tests on the permeability of sands to various fluids. Results of the experiment indicate that the permeability of a sand may be reduced as much as sixty times when penetrated by fresh water. When the fluid was changed to salt water on a core of a similar type sand the permeability was reduced only



EFFECT WATER-BASE FLUID ON SHALES

FIGURE 2

EMPLOYEE RELATIONS "... Good employee relations continue to prevail in all operations. There were no strikes or slow downs in any of our affiliated companies during 1943. Absenteeism and labor turnover were at a minimum. In some areas where other mass production industries report absenteeism as high as 18%, absenteeism among employees of affiliates is as low as 2%. There have been no production stoppages and no interruptions or slow downs since long before Pearl Harbor..."

100 OCTANE GASOLINE "... To date about 25% of U.S. and British warplanes have been powered by the high octane gasoline produced by affiliates of Standard Oil Company (New Jersey).

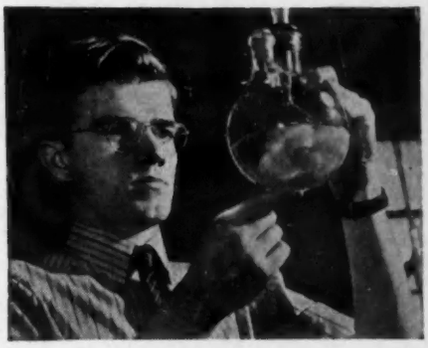
"During 1943 production of 100 octane gasoline by affiliates of the Company was 150% above their production in 1942. In addition, they contributed substantially to the development of the production facilities of other companies..."

EMPLOYEE SECURITY "...Approximately 94% of all employees eligible to participate in the Thrift Plan (to provide cash for emergency needs and a retirement income at old age) have become participants. During 1943 these latter put $12,404,000 into the Plan and the Company and its affiliates contributed $11,900,000... the Company and its affiliates paid... $4,075,000 for death, accident, or sickness benefits. The total of these payments, plus payments during 1943 to employees in the armed forces was $18,395,000..."

SYNTHETIC RUBBER "... All plants for the production of butadiene constructed under the supervision of the Company as part of the U.S. Government program were completed by the end of 1943 and all are in successful operation. They have demonstrated an ability to produce at a rate substantially greater than that called for.

"... Most of the butadiene produced in this country from petroleum under Government contracts will be produced in plants using the process developed by this Company..."

PRODUCTION "... During 1943 the oil industry in the United States pushed crude oil production to an all-time high, 7% above the previous peak of 1941. Domestic production of the affiliates of Standard Oil Company (New Jersey) during 1943 rose 36% above their own previous 1941 peak. Their gross production for the year was at the rate of 347,700 barrels a day compared with 255,293 barrels in the record year 1941..."



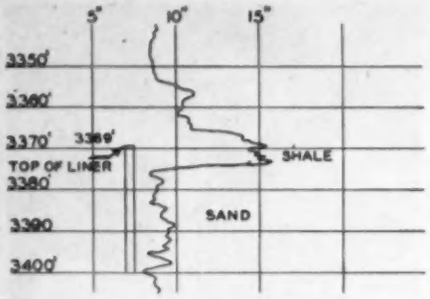
SYNTHETIC TOLUENE "... Without an adequate supply of toluene for TNT this nation and its allies could not have defended themselves in a global war. Yet today so great a quantity of synthetic toluene has been produced from petroleum that there is actually more than is required.

"... The only practical process for producing synthetic toluene was developed by this Company..."

AN APPRECIATION "... It is not possible to give credit to the thousands... who have given of themselves with a patriotic devotion which has won the warmest admiration... of the armed forces... that vigor, skill and devotion has been woven into the fabric of the United Nations war effort.

"... The President and the Board of Directors wish to express to all employees their own appreciation for the great achievements of 1943, and to thank stockholders for the confidence and support which they have consistently given..."

Total volume of business in 1943 of Standard Oil Company (New Jersey) and affiliates was $1,302,812,300 ★ Consolidated net earnings were $121,327,773 ★ Net earnings of Standard Oil Company (New Jersey) were $61,514,593 ★ Dividends paid: $2 per share ★ Number of shareholders: 149,208 ★ Payroll, including affiliates, for the year: $209,395,733 ★ Capital expenditures, including affiliates, for war since 1940: $155,879,900



LINER SHEARED OFF OPPOSITE CAVITY IN SHALE.

FIGURE 3

twenty times. Two other experimenters, working independently of each other, arrived at the same conclusion, namely, that any water loss into the producing sand is harmful.

The importance of this observation is that while a little water loss is probably less damaging than a lot of water loss, it is possible that effects of the little may be greater than heretofore suspected.

Impaired permeability may particularly occur in sands of Continental deposition, which contain ashy material or a large percentage of feldspar, together with their decomposition products, bentonite and kaolin, respectively. Some specific field experience can be cited. One well in the Mt. View field after being completed for 1160 barrels daily of 21.3 gravity oil in the Chanac zone was killed and deepened. Later, when the well was plugged back to this zone, only 106 barrels daily could be obtained on the recompletion in a heading flow. Another well in the same field flowing 784 barrels daily net oil was killed with mud and water for the purpose of plugging. Upon recompletion, the best rate obtainable was 264 barrels daily.

Experiments on sands in Cole's Levee, which contain a high percentage of feldspar, have shown a great decrease in permeability when fresh water has been pumped through them for a number of hours.

Experiments in the North Cole's Levee field and the Wilmington field have indicated a few examples that production rates are lower upon recompletion after wells have been killed with water.

The Temblor sands at Kettleman Hills often lose their productivity when exposed to formational waters, necessitating redrilling operations to bring the wells back on oil production.

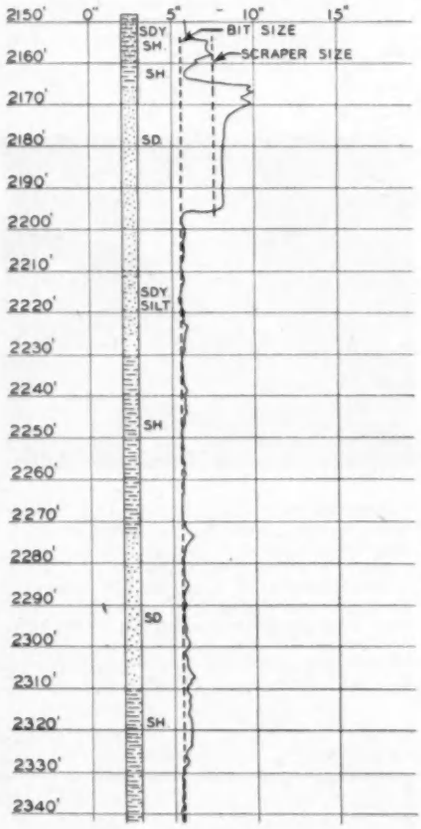
A Dominguez field well was completed as a 4000-barrel producer. Owing to a leak in the tubing head, it was necessary for the operator to kill the well to change this connection. The well was killed with water. When recompleted, the productivity index was much less than on the original completion, and although the well improved over a long period of time, it never regained its original productivity.

In recompletion of some damaged wells an operator found that recompletions were as good or better than original completions. The operator attributes this to the short time interval the sands in these wells were exposed to drilling fluid while recompleting.

At Signal Hill a DeSoto zone well was completed with a conventional liner and the well was swabbed for 30 days. During this period, over 600 barrels of fluid, mainly salt water, was recovered from the interval opened. This recovered water was tested by the laboratory and traces of phosphate used in the drilling mud were detectable at the close of the 30-day period. While this is not a large volume of water, the presence of the phosphates definitely indicate that the water from the drilling fluid had invaded what should have been the producing zone.

Effect of Water on Shales

Numerous runs of the hole caliper have shown that use of water-base mud causes beds of shale and clayey silts to run, in some cases, and gradually to



EFFECT OIL-BASE FLUID ON HOLE SIZE

FIGURE 4

slough off in other cases, to such an extent that the actual hole size opposite those formations may be twice the diameter of the bit size.

Figure 2 shows a caliper log run immediately after cleaning out the hole following the setting of the casing.

We have considerable reason to believe that shales already soaked with drilling water continue to run some time after the liner is in place and the well is on production. Moreover, if there is considerable annulus between liner and the sand bodies, the shale will tend to pack between the sand and the liner and wholly or partly shut off production or collapse liner. This may account for the rapid decline in production often seen in low pressure zones.

A well was completed in the Redondo field in July, 1936, with Grade D pipe. Within a few days after the completion of the well, on which the initial production was 161 barrels daily, the liner collapsed and production dropped rapidly to a 50-barrel daily rate. In the fall of 1943 it was decided to pull this liner and rework the well. Figure 3 shows a caliper log of this well. The top of the collapsed liner was recovered from a depth of 3369 feet. Reason for the collapse is more or less obvious from the hole caliper run. The 15-inch diameter hole at this point indicates that the unsupported wall of the hole collapsed against the liner and sheared it at 3369 feet.

Crude Oil and Oil-Base Drilling Fluids

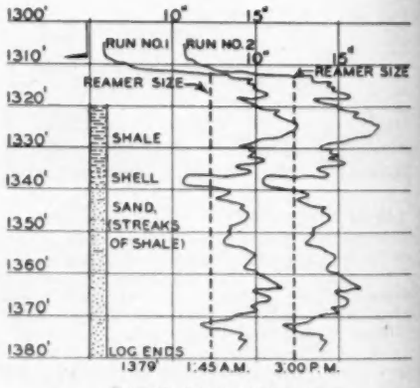
In view of the detrimental effect of water on some formations, as indicated in the laboratory at least, a few operators have resorted to various types of oil-base drilling fluids or plain crude oil for drilling in the zone. In addition, in case of oil-base fluids, there is some thought that a cake is formed which is thinner and less tough than a water-base cake, and is easily miscible in the formational fluid.

Caliper runs show that very little formation, especially shales, slough off into the hole when using one type of oil-base fluid. Figure 4 shows a caliper log on a well drilled in and partially wallscraped using this same type of oil-base drilling fluid. Note that the shales have sloughed but little although the loose part of the sand washed out during the scraping operation.

Moreover, experience on one well, at least, shows that there is no measurable build-up of cake with oil-base mud when standing in a well for the period of time necessary to run a liner and commencement of bailing operations. This is shown by examination of Figure 5. On this plate, Run 2 was made after the well had stood for 13 hours.

Instead of oil-base drilling fluid, many operators have completed wells or attempted to, by either drilling in with crude oil or by drilling in with water-base fluid and wallscraping or washing with crude oil.

This has been successful in a number of areas. In others, however, some types of shale begin sloughing badly when oil comes in contact with them and in some instances hole conditions became so bad that it was impossible



FILTER-CAKE VS TIME OIL BASE FLUID

FIGURE 5

The yardstick for measuring the value of any seismograph exploration service is *accuracy of interpretation* . . . either condemning or approving acreage. To those operators planning an exploration campaign we issue an invitation to investigate our record of operations, which provides unquestionable proof of the accuracy of our interpretations.

SEISMIC

SUBSURFACE SURVEYS

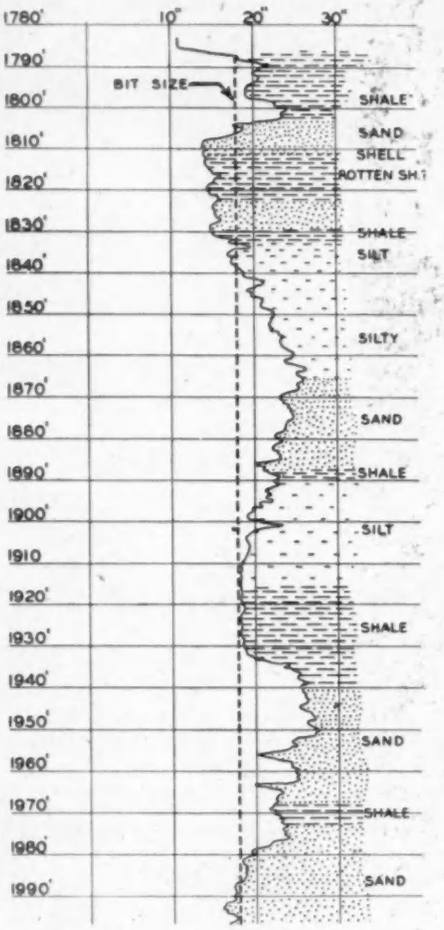
SEISMIC EXPLORATIONS INCORPORATED

HOUSTON, TEXAS

to run the liner without changing the drilling fluid. In some areas which contain shale affected by oil, it is probable that the shale continues to slough into the hole behind the liner after the well is on production, and may have the same effect as noted above, namely, that the well rapidly enters the stripper class. This condition would be aggravated by producing sand from the well which would tend to form a cavity in any sand body under shale. The shale would then slough from above the sand body into the cavity and partly or completely shut off production. The caliper log shown on Figure 6 indicates that such a condition may exist. The well shown on this figure was completed in a sand-shale section several years ago in the Kern Front field. During its production history, the well made varying amounts of sand. Recently, the liner was pulled and a caliper was run as shown. From the log it is seen that in two cases the shale had broken away above a sand cavity and presumably back-filled the annulus opposite the sand bed.

The authors have only two suggestions to prevent such packing of shale behind liners. In those areas containing shale which is not affected by oil, wells should be drilled in with crude oil or oil-base drilling fluid. In areas where shale is affected by oil, either drilling oil or formational fluid, the best solution appears to be a conventionally gravel-packed liner regardless whether or not sand conditions are bad.

Solid cementing and selective gun-perforating may also solve the problem, but this method is believed applicable in low pressure zones only in selected areas.



SHOWING CONDITION OF HOLE AFTER PULLING LINER FROM PRODUCING WELL

FIGURE 6

Other Drilling Fluids

Besides ordinary water-base mud and various types of oil-base drilling fluid, two other drilling fluids can be mentioned. Some operators prefer to drill in or freshly wallscrape low pressure zones with drilling fluid made from bentonite. This fluid makes a very lightweight mud which reduces the hydrostatic pressure against the zone and is believed to form a soft, easily removed cake. However, some laboratory experiments have shown that a bentonitic gel cake on sands of high permeability may be inadequate to prevent actual penetration of the gel into the zone. Whether or not this is detrimental, is not known.

A second completion fluid recently tried consists of water-base mud of a high alkaline value treated with hydrolized starch. This combination is said to have the effect of greatly lowering the water loss and forming a thin cake, thus both decreasing the seepage into the sands of drilling water and eliminating any harmful effect due to presence of a thick tough cake. It may have promise, especially if salt water is used as the mixing medium.

Effect of Various Fluids on Production

Considerable data indicate that presence of water, particularly fresh water, is detrimental to the effective permeability to oil of many sands, especially those of low values. This condition, of course, would seriously impair production from low pressure zones. Therefore, it would seem logical that such zones should be drilled with some fluid other than water-base muds. Wells drilled with these other drilling fluids should therefore show improvement in production over those drilled with water-base mud. However, it is extremely difficult to prove this in the field. In most fields in California, and particularly in the San Joaquin Valley, the low pressure zones vary greatly in sand content, permeability and saturation over short distances. Moreover, in the operator's desire to obtain best possible completion at the cheapest cost, it is difficult to impress him with the value of any controlled research. For example, if a good completion is obtained with bentonitic gel; or with oil-base; or with crude oil; or with plain mud, then there is no reason in the operator's opinion to change to some other mud for any later well, for which he can not be blamed.

Despite these difficulties of control, there are some field data that offer a comparison of the effect of different fluids on production.

Oil-Base Completions

In the West Coalinga oil field, several wells were drilled in one area to the light oil zone and to the tar zone with various types of drilling fluids. In two wells the zone was drilled and the well completed with water-base mud. Four wells were drilled and completed with oil-base fluid. Five wells were drilled with water-base mud and completed with one or another type of oil-base fluid. Table 1 shows the comparison of initial production and settled production in the second month. Due to varying amounts of sand thickness, production rates were reduced to barrels per foot of sand penetrated. Sand counts were made as carefully as possible to include only that sand considered permeable by determination from core analysis, by sight, or in the case of lost cores, from the self-potential curve of the electric log.

As seen from Table 1, poorest productivity occurs in those wells which were drilled and completed with water-base mud. In the light oil zone, the water-base well had the initial production of 3.2 barrels per foot of sand as against 5 barrels per foot of sand from the best well drilled and completed with oil-base mud. In the tar zone, water-base initial production was 1.1 barrels per foot of sand. The best oil-base completion was 2.5 barrels per foot of sand. In comparing wells in the light oil zone, there seems to be little advantage in drilling through the pay zone with oil-base mud over drilling through with water-base mud, but considerable advantage in completing with oil-base mud.

While it is felt that to draw conclu-

TABLE 1

Production Comparison—Water Base vs. Oil-Base Drilling Fluid

		WEST SIDE COALINGA—LIGHT OIL ZONE							TYPE FLUID	
Well	Perf.	Sand Count Feet	Gross I. P. Bbls.	Bbl./Ft. Sand	Ave. B/D 2nd Mo. Gross	Bbl./Ft. Sand	Ave. B/D 2nd Mo. Net	Bbl./Ft. Sand	Drill in	Completion
1	25 ga.	10	32	3.2	30	3.0	27.5	2.7	W.B.	W.B.
2	30 ga.	14	70	5.0	55	3.9	49	3.5	O.B.	O.B.
3	30 ga.	29	128	4.4	106	3.7	104	3.6	O.B.	O.B.
4	30 ga.	17	83	4.9	65	3.8	50	3.0	O.B.	O.B.
5	40 ga.	15	51	3.4	46	3.1	40	2.7	O.B.	O.B.
6	40 ga.	14	55	3.9	48	3.4	20	1.4	W.B.	O.B.
7	G.P.—¼"	28	132	4.7	124	4.4	104	3.6	W.B.	O.B.
		TAR ZONE								
8	G.P.—¼"	26	65	2.5	65	2.5	54	2.1	W.B.	O.B.
9	G.P.—¼"	22	30	1.3	30	1.3	25	1.1	W.B.	O.B.
10	G.P.—¼"	27	44	1.6	44	1.6	30	1.1	W.B.	O.B.
11	G.P.—¼"	25	27	1.1	24	0.9	18	0.7	W.B.	W.B.

W.B.—Water-base mud. O.B.—Oil-base mud.

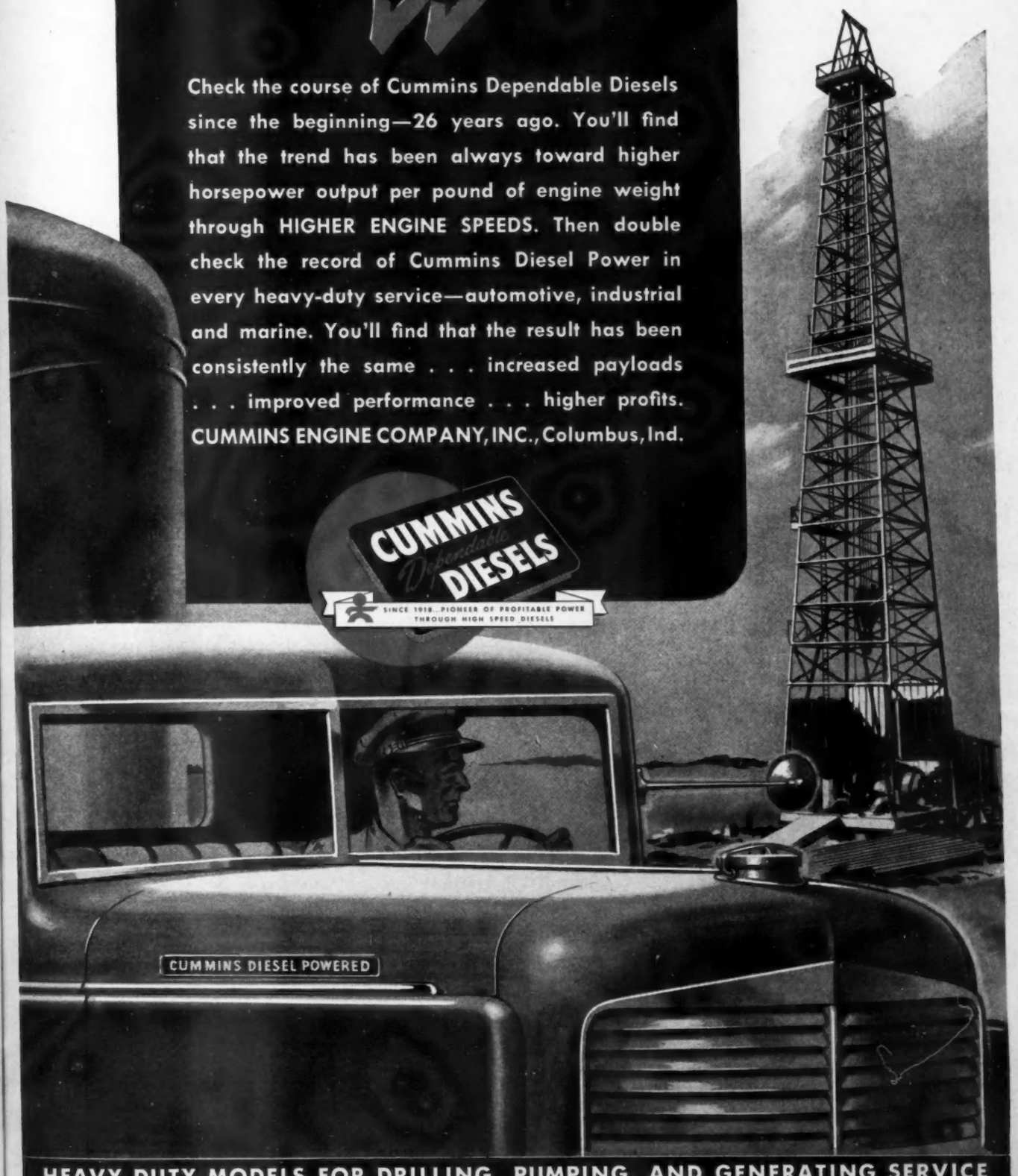
CHECK AND DOUBLE CHECK

Check the course of Cummins Dependable Diesels since the beginning—26 years ago. You'll find that the trend has been always toward higher horsepower output per pound of engine weight through HIGHER ENGINE SPEEDS. Then double check the record of Cummins Diesel Power in every heavy-duty service—automotive, industrial and marine. You'll find that the result has been consistently the same . . . increased payloads . . . improved performance . . . higher profits.

CUMMINS ENGINE COMPANY, INC., Columbus, Ind.

CUMMINS Dependable DIESELS

SINCE 1918...PIONEER OF PROFITABLE POWER THROUGH HIGH SPEED DIESELS



HEAVY-DUTY MODELS FOR DRILLING, PUMPING, AND GENERATING SERVICE

TABLE 2

Cost of Special Fluids—$/BBL.

	Initial	Recovery	Net	Trucking and Facil.	Mixing and Wash.	Total	Savings on Bailing	Net	Remarks
Type A Oil Base	$7.00	$4.60	$2.40	$0.59*	$1.00	$3.99	$0.92*	$3.07	Wash with oil to recover.
Type B Oil Base	5.00	3.25	1.75	0.59	1.00	3.34	0.92	2.42	Wash with oil to recover.
Bentonitic Gel	0.35	....	0.35	....	0.62	0.97	....	0.97	
Special Chemically Treated Fluid	0.70	....	0.70	....	0.25	0.95	....	0.95	
Hole Mud									
Additions and treatment of cement cutting								0.50	

* Based on volumes for 2200'—6⅝" hole.

sions on results involving a comparison of but two wells out of a group of eleven would be presumptuous, nevertheless, the advantage of oil-base mud is indicated.

Crude Oil Completions

Many wells have been successfully completed by using crude oil as circulating fluid and evidently its use is advantageous compared with use of water-base mud. This seems to be particularly true when using perforation sizes other than very fine. When using fine mesh liners, however, some field experience indicates that it is difficult or impossible to remove by thorough washing the oil-mud-water emulsion formed when drilling or wallscraping. This mixture may be so impervious as actually to shut off formation water. In a well of doubtful oil content drilled at Lost Hills, a 40-mesh liner was set after wallscraping and washing with oil. When the well was bailed dry, the liner was washed with distillate and the ell completed for 15 barrels daily of salt water. The liner was then gun-perforated with half-inch holes and the well again recompleted for 130 barrels daily of water.

In other areas, however, it is reported the use of crude oil has shown considerable increase in the initial and settled production over wells completed with water-base fluids.

One of the reasons that crude oil can be successfully used in certain fields is because of the low bottom hole temperature. The relationship between this temperature and the solubility of shale in crude oil is not fully understood but from the effect of crude oil at high temperatures on shale it is suspected that straight crude oil can not be used in areas where bottom hole temperatures are high.

Special Drilling Fluid Completions

Comparative data are unavailable by which conclusions can be drawn on the effect of using bentonitic gel muds or chemically treated muds for completion over the use of ordinary water-base mud.

For the chemically treated mud, the best that can be said is that it apparently has no detrimental effect as compared with wells completed with normal water-base fluid. One well drilled in South Belridge was located in the middle of a group of wells completed in the normal manner with the usual water-base mud. This well was drilled to the top of the zone with water-base mud, the casing set and the zone drilled with an excessively alkaline fluid treated with hydrolized starch. Initial and subsequent production is comparable to the average of wells drilled with water-base fluid.

Costs of Use of Drilling Fluids

Table 2 shows a comparison of the cost of using two types of oil-base drilling fluid, bentonitic gel fluids, chemically treated fluids, and ordinary water-base mud. These are calculated on a per barrel basis and on volumes necessary for 2200 feet of 6⅝-inch hole. They include trucking and other facilities wherever necessary, mixing time, and wash oil necessary to recover oil-base drilling fluid. Cost of oil-base mud is not calculated on initial cost but is based on recovery of, at least, 65 percent of the total volume used. Frequently 80 to 90 percent is recoverable, but occasionally 50 percent is lost. Therefore, the 65 percent figure is used as a conservative average.

Conclusions

It is an obvious fact that, of the many shallow wells drilled in California in low pressure zones, most must be regarded as successful completions, though drilled without particular attention to the type of drilling fluid used.

Whether or not completions would have been larger if drilled with fluids other than standard water-base mud is difficult to determine, but there is considerable unassociated evidence that this is the case.

From the data presented, it may be concluded that:

1. There is definite proof of seepage of water from the ordinary drilling mud into the sand bodies encountered in the hole.

2. Seepage of fresh water into the producing sands should be kept at a minimum or eliminated entirely to insure maximum productivity. There is definite evidence that use of oil-base drilling fluid provides greater initial and settled production.

3. Use of oil in areas where shales are present that are apt to slough on contact with oil, should be avoided as it may be harmful for the maintenance of sustained production. Sloughing, started by drilling oil, may be continuously aggravated by formation oil.

4. Favorable results of fluids other than water-base muds are indicated by many examples of good well completions, but the final evaluation must be deferred for further study.

Utilizing Natural Gas

• CONTINUED FROM PAGE 22

essed by the Fischer-Tropsch method, and an additional 4 gallons of gasoline could be recovered from each 1000 cubic feet, a daily recovery of 40,000,000 gallons of gasoline or approximately 727,000 barrels would result. Since the average daily consumption of gasoline throughout the United States at the present time amounts to 53,000,000 gallons or about 960,000 barrels, an additional supply of approximately 75 percent of daily consumption could be obtained from casinghead gas alone.

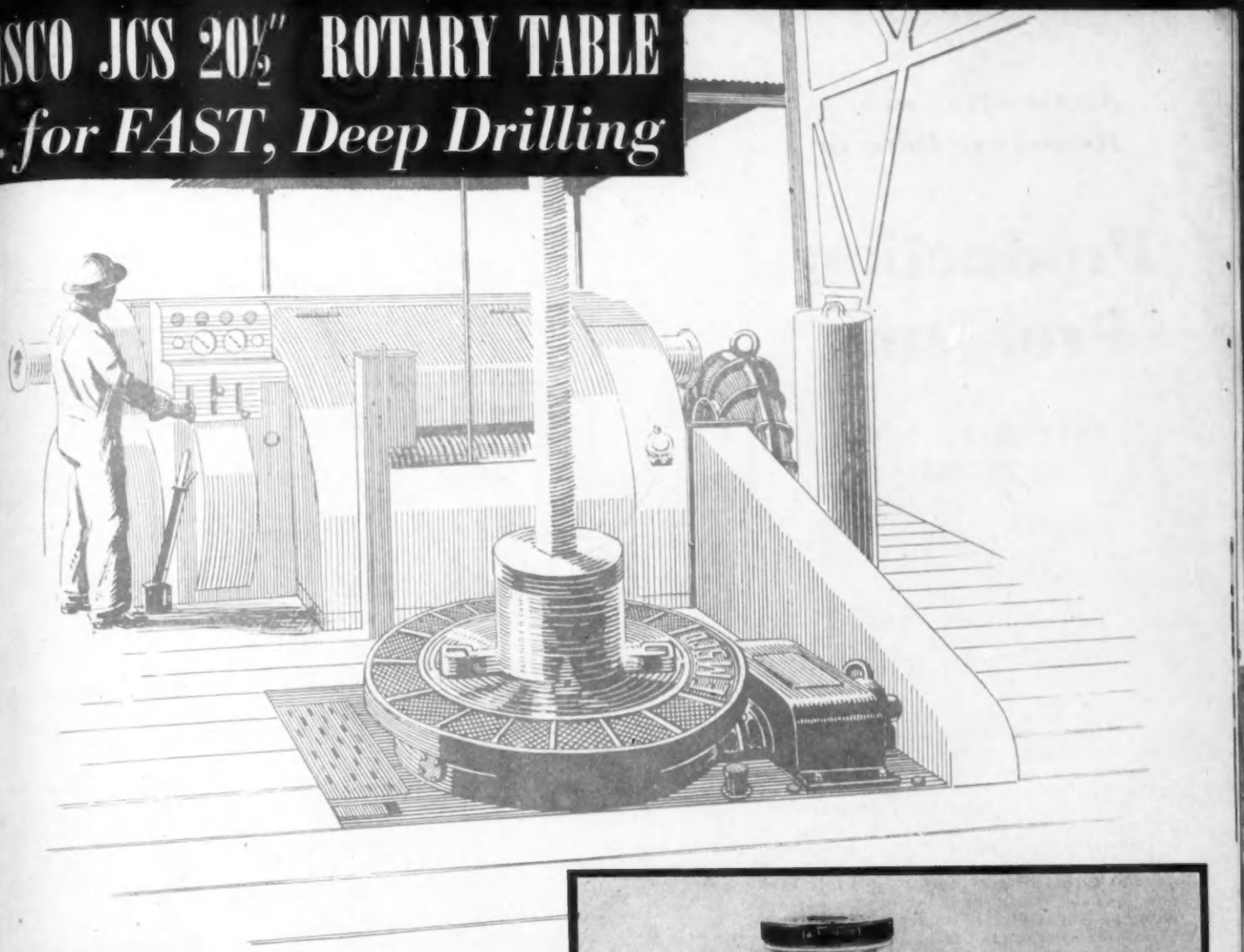
The question naturally arises, "Why don't the oil companies install this process without further delay?" The answer is, that the installation is expensive as compared to other processes, involving between 3 to 4 billions of dollars for such an ambitious program of processing 10 billion cubic feet of gas daily; and, furthermore, at the present time there would be difficulty in obtaining the materials to construct these plants.

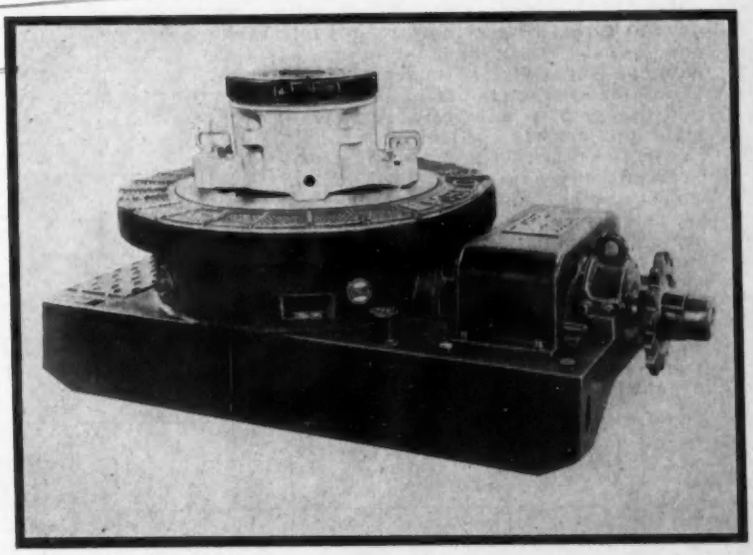
Lately government officials have been publicizing the fact that petroleum reserves only have a life of 14 or 15 years under the present rate of consumption, and therefore it is imperative to acquire petroleum reserves in foreign lands. Many do not wholeheartedly subscribe to this pessimistic outlook. However, by utilizing natural gas for immediate needs, because of its perishable nature, and later developing synthetic fuels by processing coal, and mining and retorting oil shales under a long-range program, life of petroleum reserves could be lengthened many generations to come.

More Sensible

Large sums of money may be expended by the government in acquiring foreign oil deposits, according to contemplated plans. This is causing no little apprehension in the oil industry as to whether the government will finally go into the oil business. The average citizen fears foreign entanglements and possible dangers arising in the future trying to protect such foreign oil acquisitions in the event of the threat of war or war itself. Would it not be more sensible for the government to expend its energies in utilizing local resources to the greatest possible degree and to avoid waste, thereby assuring an adequate supply of gasoline, as well as lengthening the life of petroleum reserves? Should the post war period result in a large-scale expansion of aviation, both local and global, this additional fuel assuredly will be needed.

MSCO JCS 20½" ROTARY TABLE
..for FAST, Deep Drilling





EMSCO'S long experience and knowledge of drilling requirements enables them to manufacture quality Rotary Tables which have earned world-wide confidence and approval. Emsco Rotary Tables embody the *proved* features of previous types together with new improvements.

- **TOTALLY ENCLOSED TO EXCLUDE MUD**
- **FLOOD LUBRICATED**
- **POSITIVE LOCKING PAWLS FOR BOTH DIRECTIONS**
- **CONVENTIONAL OR HIGH SPEED GEARS—OPTIONAL**
- **THOROUGHLY RUN-IN—READY *for* SERVICE**

THE CONTINENTAL SUPPLY COMPANY
General Offices: DALLAS, TEXAS
EXPORT DIVISION
30 Rockefeller Plaza New York City, N. Y.
Representatives
MEXICO ARGENTINA ENGLAND TRINIDAD BRAZIL

CONTINENTAL
SERVING THE OIL AND GAS INDUSTRIES

Application of Reservoir Data to

Production Problems

PART B OF NO. 3 OF A SERIES

By E. M. KEMLER
Professor of Mechanical Engineering
Purdue University

The previous article has discussed some applications of bottom hole pressure data to pumping tests. The general methods are also applicable to salt water disposal or water flooding wells where the flow is into the formation. Figure 1 shows what might be called a injection rate-bottom hole pressure curve for a salt water disposal well. Two general types of injection are possible, one is by gravity and the other by pumping the water in under pressure. When the characteristics of the formation are such as to give a sufficiently high productivity or injection index factor, the desired amount of fluid may be injected by gravity. The amount which can be handled by gravity can be determined by extending this injection rate-bottom-hole pressure curve until it intersects the pressure corresponding to that with the tubing full of fluid. The amount of fluid which can be injected with any given pump pressure can also be seen from this figure. A second shale marked pump pressure in pound per square inch has been indicated on this figure. The figure shows that 300 barrels could be injected by gravity and that this could be only increased to 400 barrels per day by use of 200 pounds per square inch pump pressure.

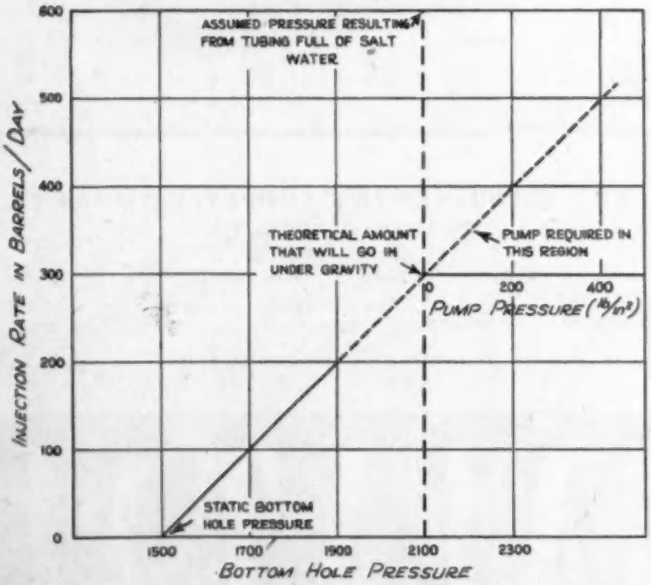


FIGURE 1

Effect of injection rate on Bhp of salt water disposal well.

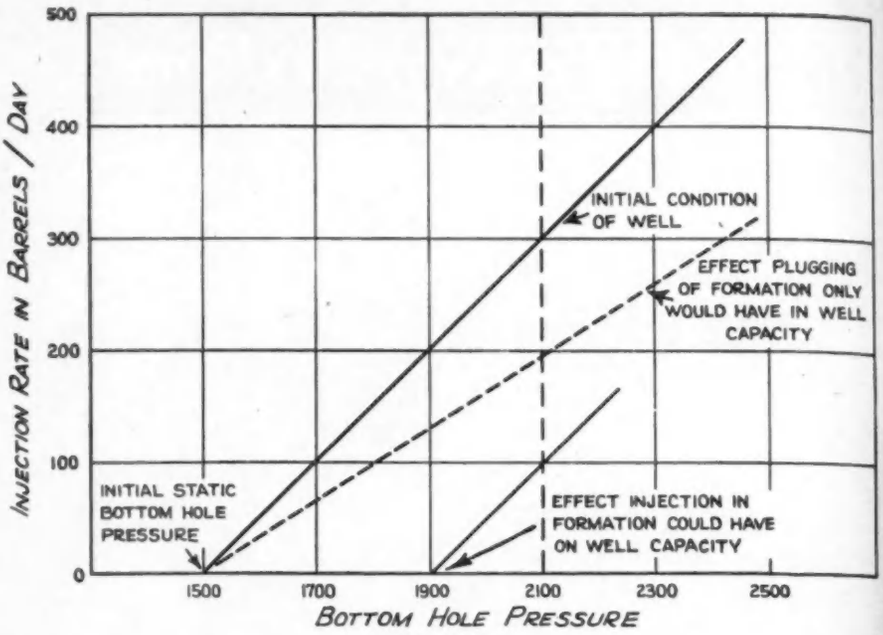


FIGURE 2

Effect of injection and plugging on salt water disposal well performance

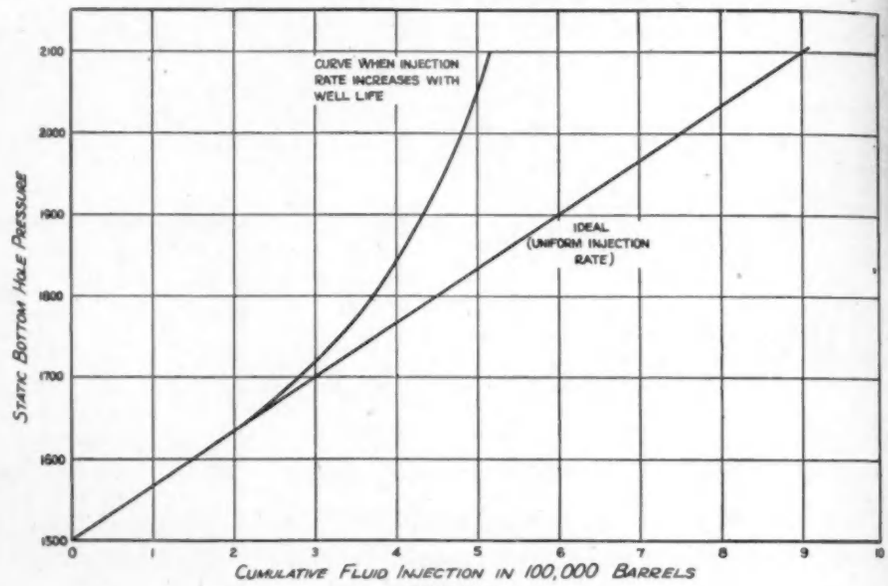
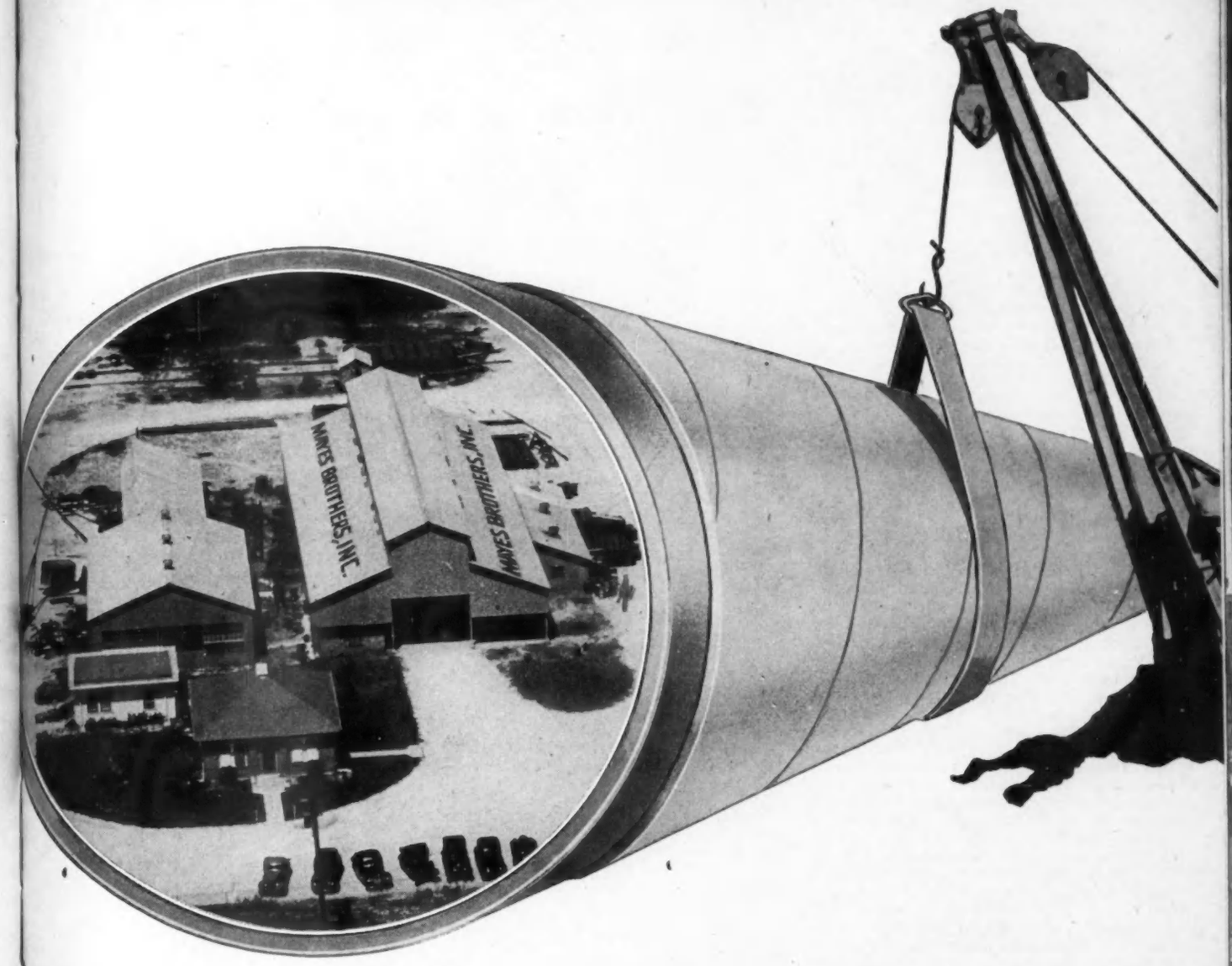


FIGURE 3

Figure 2 indicates two effects that might be experienced during the history of a salt water disposal well. The first of these is plugging of the formation and the second is the filling up of the formation. When plugging only is experienced the effect is to reduce the amount of fluid which the well will take with a given bottom hole pressure. If plugging only takes place there will be no change in the static or closed-in bottom-hole pressure. The injection rate curve for this case would be as indicated by the dotted line. Such a curve will clearly indicate decrease in capacity and immediately suggests the remedy. By acidizing the effect of plugging can be eliminated. In case the plugging is due to accumulation of scale, etc., on the surface, swabbing may be beneficial. Swabbing will reverse the direction of flow and wash off any surface plugging.

When water is injected into a formation the reverse of normal oil production takes place. If the reservoir into which the water is injected is limited in



"Putting Permanence in Pipe"

MAYES BROTHERS

INC.

PIPE CLEANING, COATING AND WRAPPING

Any Coating and Wrapping Specification

HOUSTON, TEXAS

Complete Re-conditioning Service For Old Pipe

volume and does not have a good connection to a larger or more extensive section of the same formation, the injection of the water will cause an increase in the reservoir pressure. When this condition takes place without plugging of the formation, the effect is as indicated by the lower curve of Figure 2. There is nothing which can be done about this condition. A plot of the cumulative amount of water injected into the formation against the increase in pressure increase or pressure would indicate the maximum total amount of fluid which might be injected by gravity or to any maximum pump pressure. In case the formation has a connection to another reservoir in the same formation or to an outcrop, the rate at which the pressure will build up will depend on the effective fluid flow capacity of this connection. For this reason care must be exercised in extrapolating such curves to indicate the total amount of water which might be injected into the formation. The result in such cases is to give an indicated total fluid capacity that is larger than might be experienced. The condition in this case is opposite that experienced with pumping wells. In the case of pumping wells the decline in pressure may be rapid until the withdrawal rate nearly equals the rate at which water comes into the reservoir at which pressure there is a leveling off. Figure 3 shows generally what might be expected in a salt water reservoir having a limited outlet to outcrop.

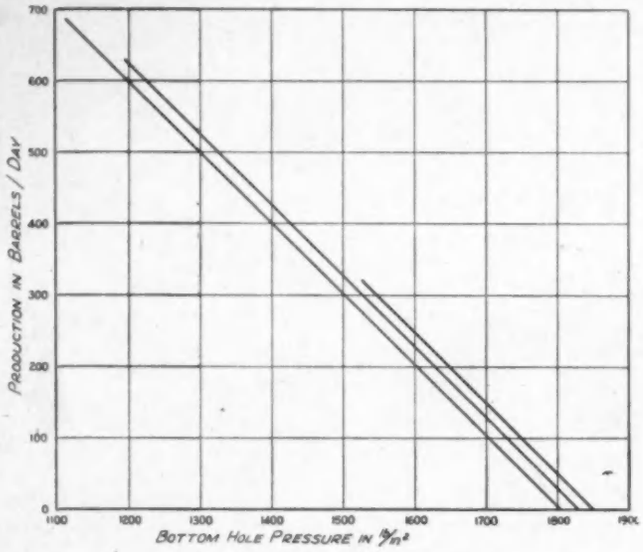


FIGURE 4

Flowing tests in Lucine Pool

When a well produces less than the amount allowed or expected or when gas-oil ratio or water production becomes excessive, some type of reconditioning is frequently undertaken. In undertaking such work, the results frequently fail to show any improvement insofar as production is concerned. In many cases such failures to obtain improved production could have been predicted from bottom hole pressure data. In other cases improvement may have been obtained but sufficient data were not obtained to show this.

The application of bottom hole pressure data, as that of any data concerning production, requires that a history of the well's behavior be known. The fundamental information which is necessary in making decisions in reconditioning work is original bottom hole pressure and original productivity factor. Figure 4 shows results of a carefully taken series of tests on flowing wells.[1] For these three wells the linear relation as given previously for production versus bottom hole producing pressure is seen to hold very closely. In order to obtain such data, test conditions must be carefully controlled. These data show to a limited extent the effect of variation in bottom hole pressure on the producing capacity of wells.

Figure 5 shows similar data on a well taken approximately one year apart. In the first case the static bottom pressure was approximately 1715 pounds per square inch, whereas in the second case it was approximately 1615 pounds per square inch. The average production versus bottom hole pressure curve as plotted through these points shows no change in slope. The theoretical capacity of the well, however, as would be determined by extrapolation of this curve would show a reduction in well capacity. Since the slope of this curve which is the productivity index factor is essentially the same, the permeability of the formation remained essentially constant. If such a condition would continue to exist to very low bottom hole pressure, the well capacity would then be reduced in proportion to the static reservoir pressure.

For a given formation the ability of a well to produce is dependent upon the viscosity of the fluid being produced as well as the permeability of the formation. Figure 6 shows what would happen in the more general case. The solid line represents the initial condition and the dot-dash line the reduction in capacity after partial depletion of the reservoir assuming no change in permeability or viscosity of the fluid. In case there is either an increase in the fluid viscosity such as might result from gas coming out of solution from the oil, the slope of the curve would further decrease as shown by the dotted line. This decrease in slope could also result from any decrease in permeability such as might result from deposits in the formation. There is some difficulty in determining the reason for such decreases in slope. Solubility-viscosity data would be of some value in this case. As was indicated in previous articles, the viscosity of the oil may more than double during the life of a well which could account for part of the change indicated.

These examples indicate a few of the possible applications of reservoir information to production problems. The improvements in techniques during recent years is increasing the importance of this subject. Further collection of data will do much to extend its application and importance.

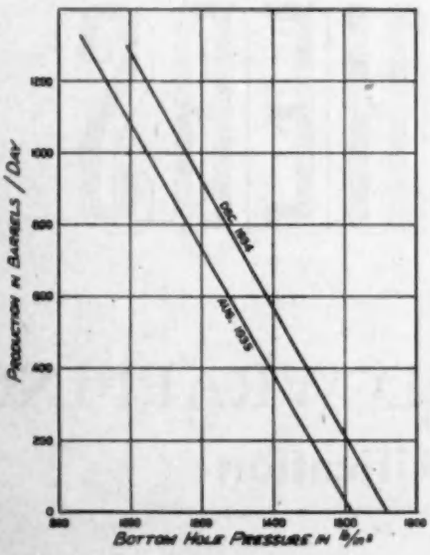


FIGURE 5

Actual effect of production on well behavior

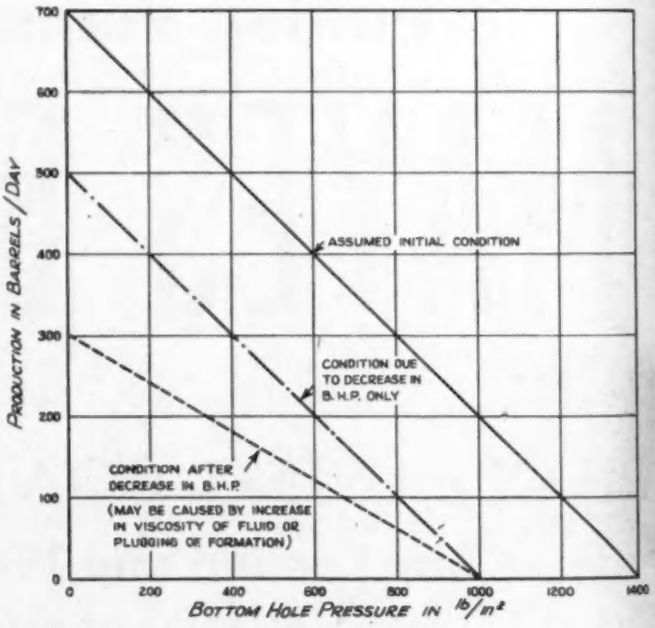
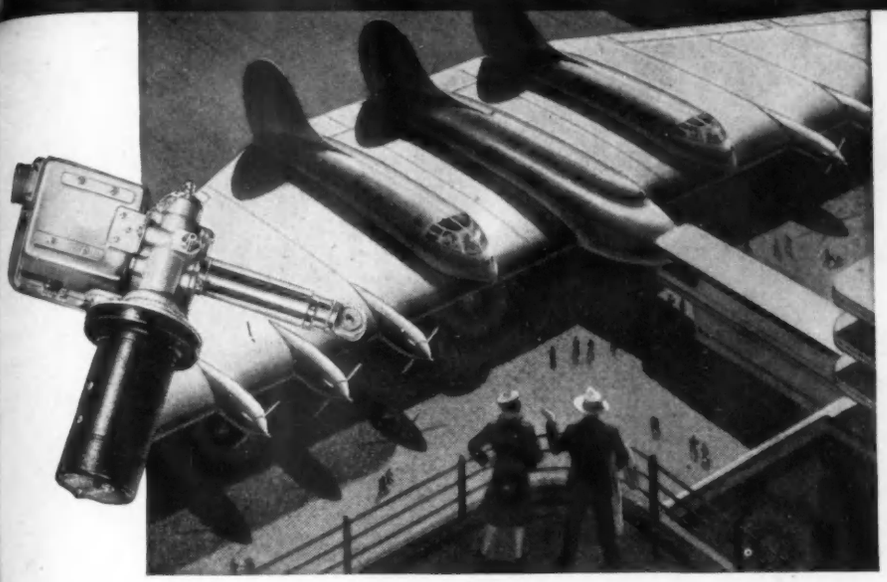

PRODUCTION IN BARRELS / DAY
ASSUMED INITIAL CONDITION
CONDITION DUE TO DECREASE IN B.H.P. ONLY
CONDITION AFTER DECREASE IN B.H.P.
(MAY BE CAUSED BY INCREASE IN VISCOSITY OF FLUID OR PLUGGING OF FORMATION)
BOTTOM HOLE PRESSURE IN lb/in²

FIGURE 6

Change in well condition resulting from decrease in Bhp and viscosity and permeability.

REFERENCE

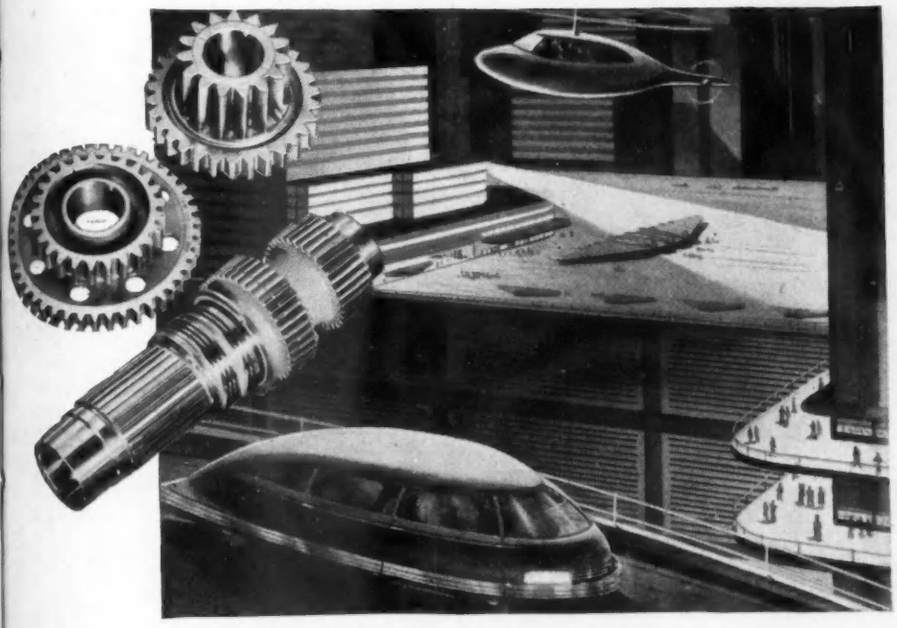
[1] M. Haider—Productivity Index—API Drilling and Production Practice, 1936.



These compact, efficient packages of power will perform many of the jobs in controlling the flight of tomorrow's skyliners. Their high precision has won them a place in today's fighter planes.

PROMISE OF A BRIGHT FUTURE

in the Transmission of Power...



Mass production of high precision gears will assure more efficient performance — greater compactness and increased speed in tomorrow's machines.

THE demands of war have brought a revolution in the economical transmission of power. Here at Foote Bros. new advances in engineering—new developments in the manufacture of extremely high precision gears, speed reducers and aircraft devices, give promise to American manufacturers of a new era of "better power transmission through better gears" when the war is won.

Tomorrow these new developments may solve problems for you in the equipment you manufacture. When that time comes, you may look to Foote Bros. for gears and speed reducers in any size—held to the tolerances you require. Foote Bros. will also be able to offer you an engineering service to assist your designers in any power transmission problem requiring the use of gears and speed reducers.

Improved speed reducer designs assure greater compactness—smoother operation and a new efficiency to tomorrow's equipment manufacturers.

FOOTE BROS. GEAR AND MACHINE CORPORATION
5225 South Western Boulevard, Chicago 9, Ill.

FOOTE BROS.

Better Power Transmission Through Better Gears

Operations at Peak and Storage Reduced to Meet Great Demand

In response to highest demand in history, oil industry during first quarter of 1944 produced and refined more crude than ever before in comparable period but still was obliged to draw heavily on storage

By L. J. LOGAN, Associate Editor

DEMAND for petroleum products continues to run at unprecedented levels, and the industry is turning out at refineries record-breaking volumes of gasoline, distillate fuel oil, residual fuel oil, lubricants, and most other products. This involves the processing of more crude than ever before was charged to stills, in plants of greater capacity than ever before were available. And in keeping the plants running at the high rates, it has been necessary to produce record volumes of crude, in spite of increased imports of crude and fuel oil, and in spite of steady withdrawals in recent months from crude storage.

Accordingly, the principal, fundamental problem with which the industry is confronted is that of maintaining the ability to produce enough of the raw material from which to make the enormously required refined products. The industry already is hard-pressed to obtain enough crude, and there is not in sight any relief from this pressure, as demand surely will continue very great.

To maintain crude-producing ability, it becomes increasingly urgent that more wells be drilled, to further develop established fields, as well as to discover more fields, whereas total drilling remains only two thirds of normal, following similar drastic curtailment in 1942 and 1943, although wildcatting is about normal.

Demand Up 17 Percent

In the first quarter of 1944 the total demand for all oils averaged 4,791,000 barrels daily, calculated without consideration of imports. That was 17 percent more than the demand in the like period last year and 24 percent more than in 1941, last prewar year for the United States. While these figures do not include that part of demand supplied by imports, it is generally known that imports have been substantially greater this year than last year, and over-all demand probably was up somewhat more than the mentioned 17 percent over last year.

In meeting this record-breaking demand, domestic production of all oils in the first quarter of 1944 averaged 4,650,000 barrels daily, or 13.4 percent more than in the similar period last year, with output of crude up 13.8 percent and that of natural gasoline up 8 percent.

Since these increases were not in proportion to expansion of demand, it was necessary to draw heavily from storage of both crude and refined oils. The withdrawals averaged about 140,000 barrels per day, having totaled 12,780,000 barrels in the three months. This compared with practically no net change in stocks in the first quarter of 1943 and withdrawals of around 6,000,000 barrels in the initial quarters of 1942 and 1941. Within the first three months of 1944 there was steady deterioration of the inventory position as compared with last year, stocks having been 5.3 percent under the year-ago trend on March 31, after having been only 2.7 percent under that trend on January 1.

The stocks of all oils in the United States totaled only 471,274,000 barrels at the end of March, 1944, and reflected steady withdrawals amounting to 86,000,000 barrels in the three years since March 31, 1941. The stocks were reduced 27,000,000 barrels in the past year, 48,000,000 the preceding 12 months, and 11,000,000 the year before that.

The 86,000,000-barrel reduction of stocks in the past three years has been accounted for largely by withdrawals of 33,000,000 barrels from crude storage, 37,000,000 from residual fuel oil stocks, and 14,000,000 from motor fuel stocks. Stocks of kerosine and distillate fuel oil have been nearly the same on March 31 for the past three years.

The 27,000,000-barrel reduction in stocks of all oils during the 12 months ended March 31, 1944, was accounted for by withdrawals of 12,500,000 barrels of residual fuel oil, 7,500,000 of crude,

United States Crude Oil Production, by States

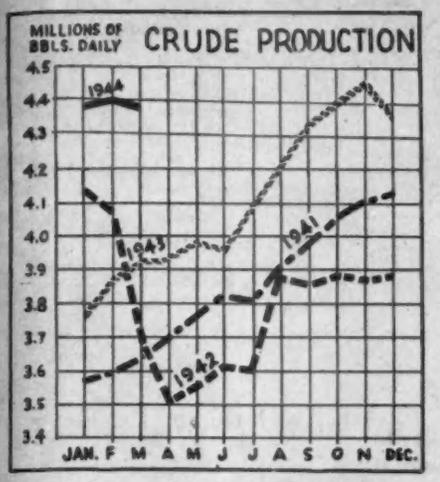
Based on data of U. S. Bureau of Mines for former years; on A.P.I. weekly reports for 1944

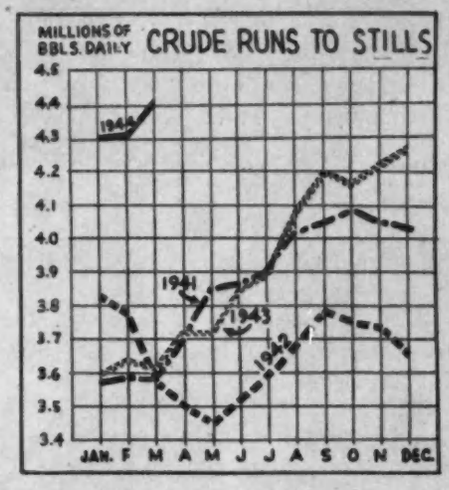
(Thousands of Barrels)

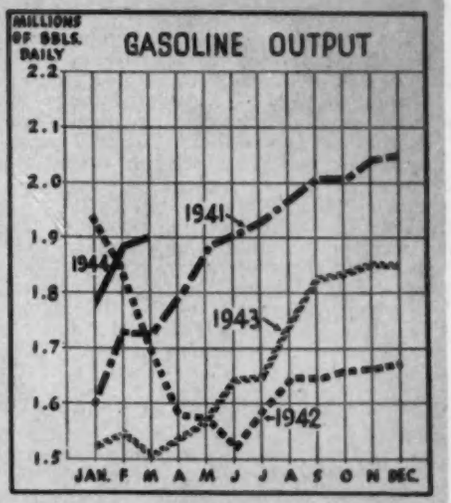
State or District	WARTIME FLUCTUATIONS IN DAILY AVERAGE CRUDE OIL PRODUCTION						TOTAL PRODUCTION OF CRUDE OIL				
	Peak Before U. S. Entry in War Dec., 1941	Low After U. S. Entry in War April, 1942	March			Percent Change '43-'44	March		First 3 Months		Percent Change
			1942	1943	1944		1943	1944	1943	1944	
Alabama	.....	.....	.....	.....	.05	+	.....	1	.....	2	+
Arkansas	74.3	71.6	74.3	71.4	79.4	+ 11.2	2,214	2,461	6,618	7,197	+ 8.7
California	631.9	637.5	607.3	776.5	826.6	+ 6.5	24,070	25,626	69,369	74,700	+ 7.7
San Joaquin Val.	261.3	269.7	260.7	361.4	387.7	+ 7.3	11,204	12,019	31,977	35,035	+ 9.6
Coastal District	87.4	72.3	67.9	109.5	124.0	+ 13.2	3,396	3,844	9,781	11,236	+ 14.9
L. A. Basin	283.3	295.5	278.7	305.5	314.9	+ 3.1	9,470	9,763	27,611	28,429	+ 3.0
Colorado	6.1	5.7	5.4	5.5	8.0	+ 63.6	170	249	526	702	+ 33.5
Florida	.....	.....	.....	.....	.05	+	.....	2	.....	2	+
Illinois	397.8	301.6	322.1	236.8	217.0	— 8.4	7,342	6,727	21,463	19,341	— 10.0
Indiana	18.6	19.8	19.5	14.8	13.5	— 8.8	458	420	1,381	1,205	— 12.7
Kansas	256.7	249.8	243.5	316.6	272.0	— 14.1	9,816	8,433	27,659	24,973	— 9.7
Kentucky	12.7	11.9	12.1	17.0	22.0	+ 29.4	526	684	1,599	1,999	+ 25.0
Louisiana	347.4	306.8	326.7	832.7	360.4	+ 8.3	10,314	11,173	29,314	32,722	+ 11.6
North Louisiana	139.3	75.3	72.6	79.2	76.5	— 3.4	2,455	2,372	7,148	7,000	— 2.1
South Louisiana	208.1	231.5	254.1	253.5	283.9	+ 12.0	7,859	8,801	22,166	25,722	+ 16.0
Michigan	56.8	62.5	49.3	57.9	52.5	— 9.3	1,795	1,628	5,205	4,761	— 8.5
Mississippi	70.5	96.2	87.3	52.9	41.4	— 21.7	1,639	1,284	4,994	3,959	— 20.7
Montana	22.0	22.0	21.6	20.6	21.0	+ 1.9	639	650	1,786	1,908	+ 6.8
Nebraska	5.1	3.9	3.9	2.3	1.3	— 43.5	71	40	198	117	— 40.9
New Mexico	112.2	67.3	82.4	94.4	112.9	+ 19.6	2,928	5,500	8,710	10,278	+ 18.0
New York	15.1	15.3	14.6	14.6	13.3	— 8.9	453	411	1,260	1,170	— 7.1
Ohio	9.9	10.6	9.5	9.5	8.7	— 8.4	293	271	790	782	— 1.0
Oklahoma	427.6	389.6	400.8	349.9	329.3	— 5.9	10,846	10,210	31,216	29,819	— 4.5
Pennsylvania	49.3	52.7	49.0	45.8	41.2	— 10.0	1,419	1,278	4,006	3,656	— 8.7
Texas	1,532.3	1,081.0	*1,265.3	*1,403.3	1,866.4	+ 33.0	*43,502	57,854	*122,463	172,019	+ 40.5
E. Texas Field	386.2	225.4	312.3	323.4	366.5	+ 13.3	10,025	11,362	29,002	33,986	+ 17.2
Other E. Texas	86.1	78.7	86.0	99.8	116.6	+ 16.8	3,093	3,615	8,956	10,513	+ 17.4
North Texas	137.1	130.5	146.5	136.4	142.5	+ 4.5	4,229	4,416	12,117	12,835	+ 5.9
West Texas	302.4	185.8	213.3	218.1	342.0	+ 56.8	6,759	10,601	18,692	32,296	+ 72.8
Panhandle	92.1	83.5	84.8	88.6	93.4	+ 5.4	2,746	2,895	7,890	8,855	+ 12.2
Gulf, Upper	303.2	277.5	262.0	353.5	514.0	+ 45.4	10,958	15,933	29,195	47,039	+ 61.1
Gulf, Lower	126.9	82.6	105.5	105.8	195.6	+ 84.9	3,269	6,063	9,125	17,696	+ 93.9
Southwest Texas	78.2	48.0	63.0	50.6	75.9	+ 50.0	1,567	2,353	4,386	6,988	+ 59.3
South Central	20.1	19.0	19.0	16.9	19.9	+ 17.8	521	617	1,521	1,811	+ 19.1
West Virginia	9.8	10.4	10.0	9.5	8.9	— 6.3	295	275	852	775	— 9.0
Wyoming	82.2	85.4	87.9	89.2	91.5	+ 2.6	2,766	2,838	7,764	8,438	+ 8.7
Others	.2	.2	.2	.1	0.	.....	4	.....	13	0.	.....
Total U. S.	4,138.5	3,501.8	3,692.7	3,921.3	4,387.5	+ 11.9	121,560	136,012	347,186	400,525	+ 15.4

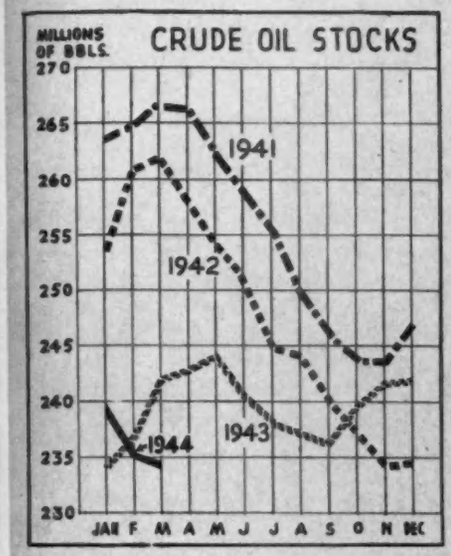
* Data by district on A. P. I. basis, and therefore do not agree exactly with Texas total.

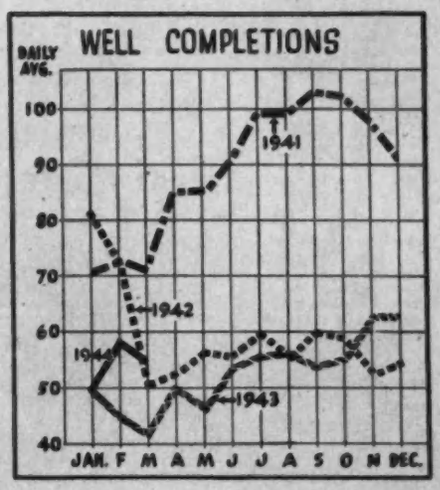
Monthly Activity Trends

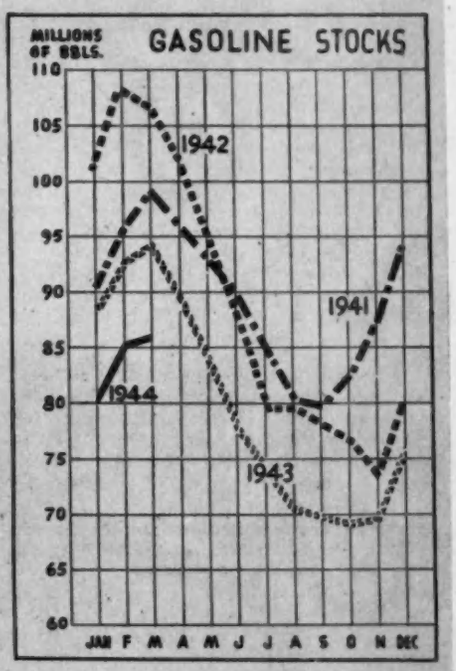


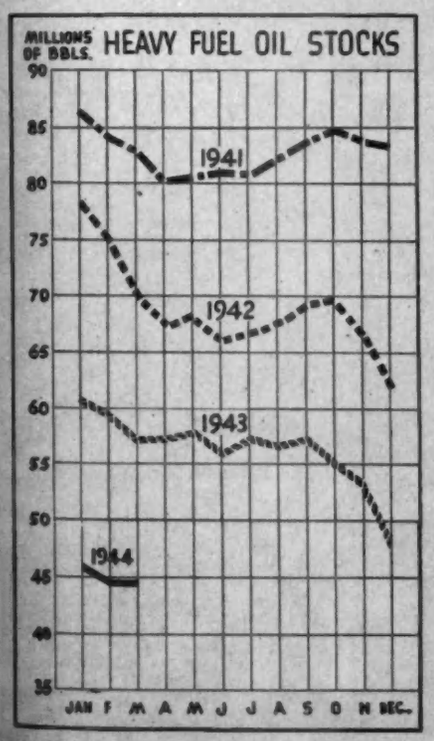


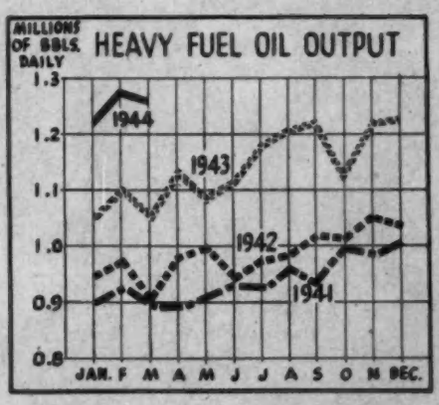


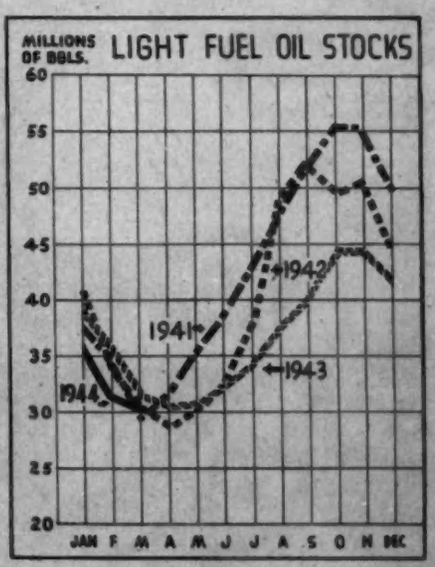


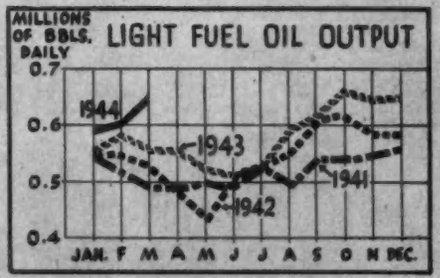












7,500,000 of motor fuel, and 500,000 of distillate fuel oil, while kerosene stocks were increased 2,000,000 barrels.

Days' Supply Low

On the basis of daily average demand for all oils in the first quarter of 1944, stocks of 471,274,000 barrels of all oils March 31, 1944, represented only 98 days' supply, whereas inventories of 497,820,000 barrels March 31, 1943, were equivalent to 122 days' supply. End-of-March stocks represented 128 days' supply in 1942 and 145 days' in 1941.

The decline in crude stocks as of the end of the first quarter, in terms of days' supply at the daily average rate of demand during the quarter, has been from 75 days' supply on March 31, 1941, to 69 days' in 1942, 64 days' in 1943, and 52 days' supply at the end of March, 1944.

Motor fuel stocks on March 31, 1941, similarly were equivalent to 60 days' supply, and they represented 63 days' supply in 1942, 66 days' supply in 1943, but with demand up sharply this year, only 48 days' supply on March 31, 1944.

Residual fuel stocks, having been reduced 12,500,000 barrels in the past year, came down 22 percent in volume and 33 percent in days' supply, having represented only 32 days' supply on March 31 this year. With volumes in storage larger and demand not so great, inventories of residual at the end of March were equivalent to 48 days' supply in 1943, 61 days' supply in 1942, and 80 days' supply in 1941.

Under rationing of heating oil, demand for distillate fuel has not fluctuated very much from seasonal trends during the war period, and end-of-March stocks likewise have not changed materially. Therefore, they have been consistently around 40 days' supply at that time of the year.

Demand for Crude and Products

Closely in line with the 17-percent increase in daily average total demand for all oils in the first quarter of 1944 as compared with the like period of 1943, there was an increase of 18.3 percent in

Stocks of Crude Petroleum in the United States, by Grades, at the End of March, 1941-1944

Data from Weekly Reports of U. S. Bureau of Mines

(Thousands of Barrels)

Grade or Origin	END OF MARCH			
	1941 (March 29)	1942 (March 28)	1943 (March 27)	1944 (March 25)
Pennsylvania Grade	4,291	3,431	2,740	2,438
Other Appalachian	1,400	1,522	1,307	1,368
Lima-Michigan	1,114	1,549	996	958
Illinois-Indiana	21,807	19,337	10,747	13,940
Arkansas	2,888	2,977	2,457	2,770
Kansas	8,961	7,696	8,372	7,513
Louisiana	12,897	13,669	13,260	14,098
Northern	4,342	4,223	4,379	3,628
Gulf Coast	8,555	9,446	8,881	10,470
Mississippi	789	2,445	1,272	851
New Mexico	7,222	7,510	7,190	7,045
Oklahoma	64,276	50,513	37,465	32,667
Texas	85,178	96,123	105,391	115,956
East Texas	20,561	23,677	24,659	22,930
West Texas	15,953	23,961	24,006	30,300
Gulf Coast	23,544	25,889	30,011	34,726
Other Texas	25,120	22,596	26,715	28,000
Panhandle	.....	.....	5,345	6,378
North	.....	.....	7,365	5,565
South	.....	.....	4,639	6,084
Other	.....	.....	9,366	9,973
Rocky Mountain	15,575	16,628	13,553	10,144
California	37,221	38,454	34,306	24,944
Foreign	2,568	1,854	70	1,593
Total Gasoline-Bearing in U. S.	266,187	263,208	239,126	236,285
Heavy in California	11,963	11,336	10,839	6,366
Total in U.S.	278,150	274,544	249,965	242,651

Production, Changes in Stocks, and Demand for Crude and Products

Also yields of products from crude. Data for 1944 based on A.P.I. reports; for previous years on Bureau of Mines reports.

(Thousands of Barrels)

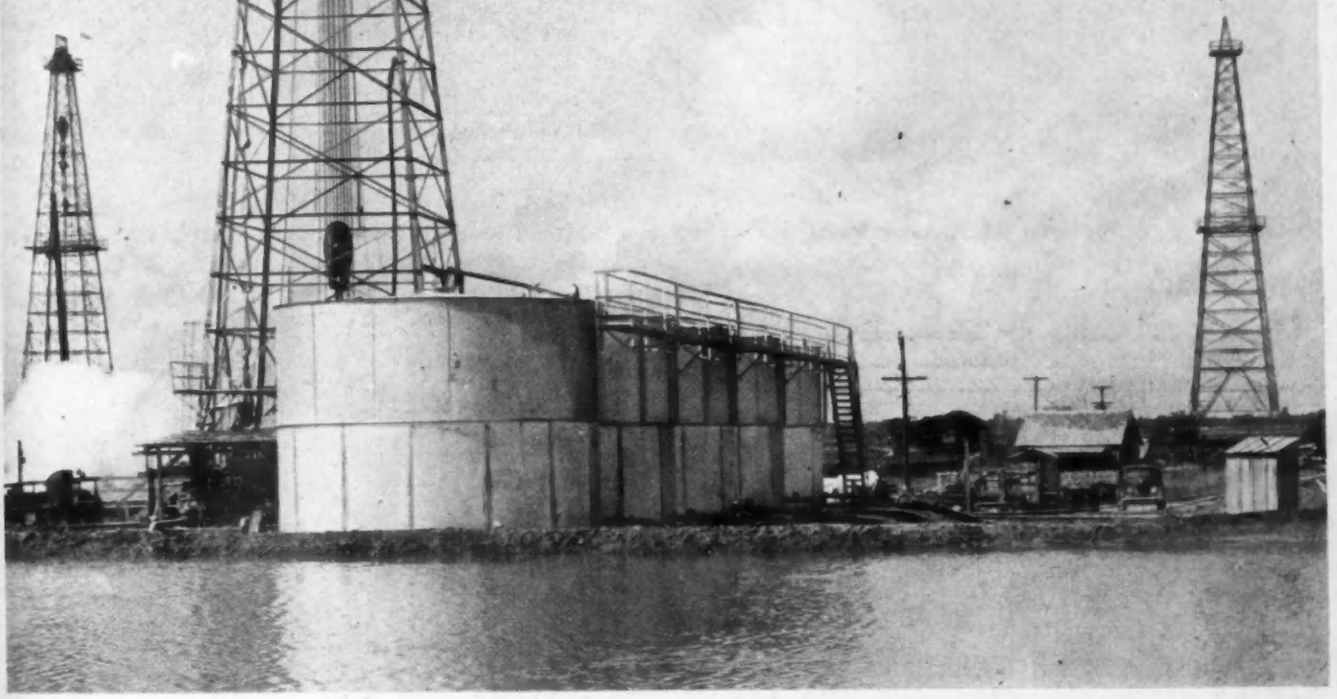
ITEM	MARCH					FIRST 3 MONTHS				
	1941	1942	1943	1944	Percent Change '43-'44	1941	1942	1943	1944	Percent Change '43-'44
ALL OILS										
Domestic Production, Total	118,050	121,693	129,117	144,012	+11.5	339,530	378,569	368,943	423,164	+14.7
(Daily Average)	3,808	3,926	4,165	4,646	+11.5	3,773	4,206	4,099	4,650	+13.4
Crude Oil	112,817	114,473	121,560	136,012	+11.9	324,255	356,696	347,186	399,664	+15.1
Natural Gasoline	4,916	7,020	7,557	8,000	+ 5.9	14,456	21,276	21,757	23,500	+ 8.0
Benzol	317	200	.....	.....	.....	910	597	.....	.....	.....
Imports, Total	8,798	.....	.....	.....	.....	21,259	.....	.....	.....	.....
Crude	3,821	.....	.....	.....	.....	9,985	.....	.....	.....	.....
Refined	4,977	.....	.....	.....	.....	11,274	.....	.....	.....	.....
Change in Stocks	—831	—9,874	+235	—8,681	.....	—6,592	—5,605	+415	—12,780	.....
Stocks Beginning of Period	558,193	555,982	497,585	479,955	— 3.5	563,954	551,713	497,405	484,054	— 2.7
Stocks End of Period	557,362	546,108	497,820	*471,274	— 5.3	557,362	546,108	497,820	*471,274	— 5.3
(Days' Supply)	145	129	120	96	—20.0	145	128	122	98	—19.7
Demand, Excl. of Imports	118,881	131,567	128,882	152,693	+18.5	346,122	384,174	368,525	435,944	+18.3
(Daily Average)	3,835	4,244	4,157	4,926	+18.5	3,846	4,269	4,095	4,791	+17.0
Demand, Incl. of Imports	127,679	.....	.....	.....	.....	367,381	.....	.....	.....	.....
CRUDE OIL										
Demand, by Source—										
Domestic Production	112,817	114,473	121,560	136,012	+11.9	324,255	356,696	347,186	399,664	+15.1
(Daily Average)	3,696	3,693	3,921	4,387	+11.9	3,603	3,963	3,858	4,392	+13.8
Imports	3,821	.....	.....	.....	.....	9,985	.....	.....	.....	.....
Change in Stocks, Refinable	+1,943	+ 933	+5,106	—5,333	.....	+2,296	+14,893	+7,292	—7,095	.....
Stocks Beginning of Period	265,062	261,459	237,075	240,000	— 1.2	264,709	247,499	234,889	241,762	+ 2.9
Stocks End of Period	267,005	262,392	242,181	234,667	— 3.1	267,005	262,392	242,181	234,667	— 3.1
(Days' Supply)	75	72	58	51	—12.1	75	69	64	52	—18.8
Demand, Excl. of Imports	110,874	113,540	116,454	141,345	+21.4	321,959	341,803	339,894	406,759	+19.7
(Daily Average)	3,577	3,663	3,757	4,560	+21.4	3,577	3,798	3,777	4,470	+18.3
Demand, Incl. of Imports	114,695	.....	.....	.....	.....	331,944	.....	.....	.....	.....
Demand, by Use—										
Run to Stills, Total	111,059	110,725	112,013	136,855	+22.2	322,187	335,627	325,554	395,581	+21.5
(Daily Average)	3,583	3,572	3,613	4,415	+22.2	3,579	3,729	3,617	4,347	+20.2
Domestic	107,220	108,471	111,909	.....	.....	311,814	325,742	325,118	.....	.....
Foreign	3,839	2,254	104	.....	.....	10,573	9,885	436	.....	.....
Exports	2,058	4,401	4,571	6,500	+42.2	4,946	13,445	14,654	18,900	+29.0
Transfers to Fuel Oil Stocks, Other Fuel, and Losses	1,393					4,439				
Demand, Excl. of Exports	112,452	.....	.....	.....	.....	326,626	.....	.....	.....	.....
Demand, Incl. of Exports	114,510	115,126	116,584	143,355	+23.0	331,572	349,072	340,208	414,481	+21.8
(Daily Average)	3,694	3,714	3,761	4,624	+23.0	3,684	3,879	3,780	4,555	+20.5
MOTOR FUEL										
Production, Total	54,221	53,097	46,253	59,059	+27.7	156,760	164,907	137,169	169,303	+23.4
(Daily Average)	1,749	1,713	1,492	1,905	+27.7	1,742	1,832	1,524	1,860	+22.0
Imports	281	.....	.....	.....	.....	733	.....	.....	.....	.....
Change in Stocks	+2,912	—635	+1,676	+2,891	.....	+13,185	+14,319	+14,135	+12,536	.....
Stocks, Beginning of Period	93,920	105,550	87,863	79,150	— 9.9	83,647	90,596	75,404	69,505	— 7.8
Stocks, End of Period	96,832	104,915	89,539	82,041	— 8.4	96,832	104,915	89,539	82,041	— 8.4
(Days' Supply)	58	61	62	45	—27.4	60	63	66	48	—27.3
Finished Gasoline	91,501	99,295	84,077	77,541	— 7.8	91,501	99,295	84,077	77,541	— 7.8
Natural Gasoline	5,331	5,620	5,462	4,500	—17.6	5,331	5,620	5,462	4,500	—17.6
Demand(Excl.Small Imports)	51,590	53,732	44,577	56,168	+26.0	144,308	150,588	123,034	156,767	+27.4
(Daily Average)	1,664	1,733	1,438	1,812	+26.0	1,603	1,673	1,367	1,723	+26.0
GASOLINE										
Production (straight run, cracked, natural blended)	51,950	50,652	45,001	59,059	+31.2	149,964	158,740	131,825	169,303	+28.4
(Daily Average)	1,676	1,634	1,452	1,905	+31.2	1,666	1,764	1,463	1,860	+27.1
†Percent Yield from Crude	43.4	41.8	35.8	38.8	.....	43.2	43.1	36.3	38.6	.....
Imports	281	.....	.....	.....	.....	733	.....	.....	.....	.....
Change in Stocks, Finished	+2,892	—1,046	+1,210	+2,541	.....	+13,558	+13,136	+13,305	+12,577	.....
Stocks, Beginning of Period	88,609	100,341	82,867	75,000	— 9.5	77,943	86,159	70,772	64,964	— 8.2
Stocks, End of Period	91,501	99,295	84,077	77,541	— 7.8	91,501	99,295	84,077	77,541	— 7.8
(Days' Supply)	58	60	60	43	—28.3	60	61	64	45	—29.7
Demand(Excl.Small Imports	49,058	51,698	43,791	56,518	+29.1	136,406	145,604	118,520	156,726	+32.2
(Daily Average)	1,583	1,668	1,413	1,823	+29.1	1,516	1,618	1,317	1,722	+30.8
KEROSENE										
Production	6,033	6,035	6,326	6,878	+ 8.7	18,582	18,802	17,800	20,282	+13.9
(Daily Average)	195	195	204	222	+ 8.7	206	209	198	223	+12.6
Percent Yield from Crude	5.3	5.3	5.2	5.1	.....	5.7	5.3	5.1	5.1	.....
Imports	43	.....	.....	.....	.....	43	.....	.....	.....	.....
Change in Stocks	—910	—1,424	—1,074	—422	.....	—2,788	—6,615	—5,196	—2,656	.....
Stocks, Beginning of Period	7,634	9,324	5,942	7,125	+19.9	9,512	14,515	10,064	9,359	— 7.0
Stocks, End of Period	6,724	7,900	4,868	6,703	+37.7	6,724	7,900	4,868	6,703	+37.7
(Days' Supply)	30	33	20	29	+45.0	28	28	19	27	+42.1
Demand	6,986	7,459	7,400	7,300	— 1.4	21,413	25,417	22,996	22,938	— 0.3
(Daily Average)	225	241	239	235	— 1.7	238	282	256	252	— 1.6
DISTILLATE FUEL OIL										
Production	15,387	16,214	17,288	20,269	+17.2	47,137	48,310	50,834	56,355	+10.9
(Daily Average)	496	523	558	654	+17.2	524	537	565	619	+ 9.6
Percent Yield from Crude	13.6	14.2	14.2	14.9	.....	14.5	13.5	14.6	14.1	.....
Transfers from Crude	226	187	229	281	+22.7	630	592	666	819	+23.0
Imports	277	.....	.....	.....	.....	1,181	.....	.....	.....	.....
Change in Stocks	—4,985	—3,506	—4,163	—3,036	.....	—13,106	—19,721	—13,805	—11,198	.....
Stocks, Beginning of Period	34,790	33,711	35,298	33,566	— 4.9	42,911	49,926	44,940	41,728	— 7.1
Stocks, End of Period	29,805	30,205	31,135	30,530	— 1.9	29,805	30,205	31,135	30,530	— 1.9
(Days' Supply)	45	47	45	40	—11.1	44	40	43	41	— 4.7
Demand, Excl. of Imports	20,598	19,907	21,680	23,586	+ 8.8	60,873	68,623	65,305	68,372	+ 4.7
(Daily Average)	664	642	699	761	+ 8.8	676	762	726	751	+ 3.4
Demand, Incl. of Imports	20,875	.....	.....	.....	.....	62,054	.....	.....	.....	.....
REDISUAL FUEL OIL										
Production	27,677	28,095	32,700	39,180	+19.8	81,501	84,754	96,043	114,246	+19.0
(Daily Average)	893	906	1,055	1,264	+19.8	906	942	1,067	1,255	+17.6
Percent Yield from Crude	24.5	24.5	26.9	28.8	.....	25.1	23.8	27.7	28.6	.....
Transfers from Crude	660	1,613	1,914	3,055	+59.6	2,291	4,753	5,672	9,009	+58.8
Imports	4,210	.....	.....	.....	.....	9,037	.....	.....	.....	.....
Change in Stocks	—1,268	—5,297	—2,377	+2,340	.....	—7,670	—13,097	—4,503	—3,665	.....
Stocks, Beginning of Period	82,902	75,386	59,657	42,479	—28.8	89,304	83,195	61,783	48,484	—21.5
Stocks, End of Period	81,634	70,098	57,280	44,819	—21.8	81,634	70,098	57,280	44,819	—21.8
(Days' Supply)	85	62	48	35	—27.1	80	61	48	32	—33.3
Demand, Excl. of Imports	29,605	35,005	36,991	39,895	+ 7.9	91,462	102,604	106,218	126,920	+19.5
(Daily Average)	955	1,129	1,193	1,287	+ 7.9	1,016	1,140	1,180	1,395	+18.2
Demand, Incl. of Imports	33,815	.....	.....	.....	.....	100,499	.....	.....	.....	.....

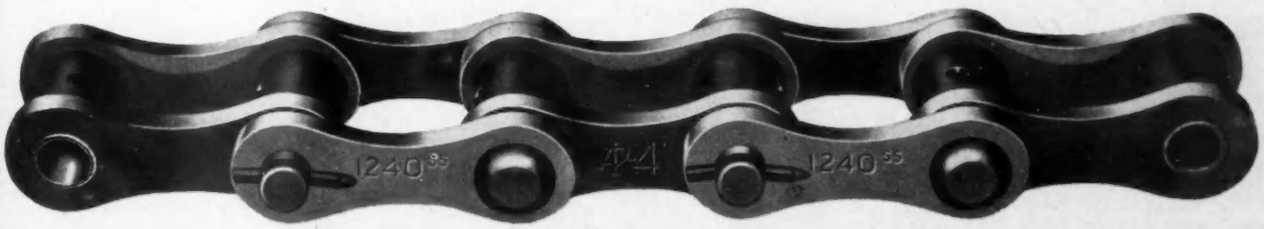
*Incl. 234,667 refnble crude, 6,507 hvy crude in Calif., 4,500 natrl. gasine, 225,600 refd prods. †Straight run, cracked.

THE DEMANDS OF DEEPWELL DRILLING

have shown that Baldwin Oil Field Chains are built right . . . built to withstand the tremendous stress and strain of driving a drill stem deep into the earth and pulling thousands of feet of pipe out of the hole. This toughness . . . their resistance to fatigue and shock loads give Baldwin chains the ability to deliver lowest cost per foot of hole. Buy Baldwin and get the best.

BALDWIN-DUCKWORTH *Division of Chain Belt Company, 341 Plainfield Street, Springfield 2, Mass.*





BALDWIN CHAINS TRANSMIT ALL THE POWER

daily average demand for crude—to 4,470,000 barrels in the first quarter of 1944 from 3,777,000 in 1943. However, increased proportions of the demand were met by withdrawals from storage and imports and reduced proportions by domestic production. In fact, the 7,000,000-barrel withdrawal from crude stocks in this year's first quarter contrasted with an accumulation of 7,000,000 barrels in the first three months of last year. Domestic production of crude, having averaged 4,392,000 barrels daily, was 13.8 percent higher than last year—an increase not in line with the expansion of demand, although a clear new record for the period was established.

Among the refined products, the most noteworthy increase in demand this year has been that for motor fuel. The daily average demand of 1,723,000 barrels in the first quarter of 1944 was 26 percent greater than demand in the like period last year, in reflection of sharply higher military needs, and exceeded by 7.5 percent the daily average demand in the first three months of 1941, setting a new record for the period.

Demand for residual fuel oil likewise broke all previous records. The 1,395,000 barrels per day required in the first quarter of 1944 represented an increase of 18 percent over last year and 37 percent over 1941, not considering imports in either year.

Curtailment of the use of lubricants by motorists has been more than offset by increases in military and industrial demand, and production of those oils averaged 113,000 barrels daily in the first quarter of 1944, an increase of 14 percent over last year and 23 percent over 1941.

U. S. Crude Runs to Stills and Percent of Refinery Capacity Used

(Thousands of Barrels)

State or District	Peak Before U. S. Entry in War Oct. 1941		Low After U. S. Entry in War May 1942		Current Crude Runs and Use of Refinery Capacity Compared with Year Ago					Total Crude Runs to Stills in First 3 Months of Year		
					March, 1943		March, 1944					
	Runs Daily	Percent of Plant Capacity Used	Runs Daily	Percent of Plant Capacity Used	Runs Daily	Percent of Plant Capacity Used	Runs Daily	Percent of Plant Capacity Used	Percent Change in Runs March '43-'44	1943	1944	Percent Change
East Coast, Texas Inland, Texas Gulf, La. Gulf, Ark. and La. Inland	2,127	93.1	1,498	63.7	1,649	67.5	2,258	92.2	+36.9	146,890	197,726	+34.6
Appalachian	147	88.6	158	91.4	150	84.7	151	85.3	+ 0.7	13,805	13,755	— 0.4
Ind., Ill., Ky., etc.	734	97.6	735	99.2	702	86.6	762	92.5	+ 8.5	64,122	69,393	+ 8.1
Okla., Kansas, Mo.	368	89.1	359	86.1	339	81.7	345	82.9	+ 1.8	30,435	31,71	+ 4.4
Rocky Mountain	94	69.1	91	65.2	88	59.9	107	71.8	+20.6	8,186	9,685	+18.3
California	618	78.5	605	78.3	685	83.8	792	96.9	+15.6	62,116	73,251	+17.9
Total United States	4,088	90.1	3,446	75.2	3,613	75.1	4,415	91.4	+22.2	325,554	395,581	+21.5

Stocks of Major Petroleum Products Held by Refining Companies in U. S. at End of March, Compared with Year Ago and 2 Years Ago

Stocks at refineries, at bulk terminals, in transit and in pipe lines. Data for 1942 and 1943 from Bureau of Mines monthly reports; for 1944 from weekly reports of American Petroleum Institute

(Thousands of Barrels)

DISTRICT	FINISHED AND UNFINISHED GASOLINE Stocks End of March			KEROSINE Stocks End of March			GASOIL AND DISTILLATE FUEL Stocks End of March			RESIDUAL FUEL OIL Stocks End of March		
	1942	1943	1944	1942	1943	1944	1942	1943	1944	1942	1943	1944
East Coast, Texas Gulf, La. Gulf, N. La.-Ark., and Inland Texas	48,741	40,453	38,723	5,419	2,669	4,166	14,345	14,477	14,413	15,664	10,433	15,864
Appalachian	4,196	2,633	3,415	217	259	250	409	724	1,385	562	406	330
Indiana, Illinois, Kentucky	23,211	20,314	20,788	962	925	1,293	2,526	3,339	4,871	3,556	2,452	2,901
Oklahoma, Kansas, Missouri	10,417	7,571	8,526	462	436	385	912	1,441	1,495	1,301	1,296	1,267
Rocky Mountains	2,926	2,272	2,218	119	67	94	283	366	383	555	602	576
California	17,242	20,871	15,492	721	512	515	11,730	10,788	7,983	48,460	42,091	23,981
Total United States	106,733	94,114	89,162	7,900	4,868	6,703	30,205	31,135	30,530	70,098	57,280	44,819

Refinery Production of Major Products and Percent Yield from Crude Run, by Districts

Results in March and First Quarter, 1944, Compared with Like Periods Last Year and in 1941, Last Preceding Pearl Harbor.

Data for 1944 based on A.P.I. weekly reports; for former years compiled from Bureau or Mines reports.

THOUSANDS OF BARRELS

DISTRICT	*Gasoline			Kerosine			Distillate Fuel Oil			Residual Fuel Oil			Lubricants		
	1941	1943	1944	1941	1943	1944	1941	1943	1944	1941	1943	1944	1941	1943	1944
East Coast, Texas Gulf, La. Gulf, North La., Ark., and Inland Texas															
Production, March	25,096	20,655	29,042	3,690	3,554	4,247	9,130	9,058	12,968	13,872	13,448	18,928	1,512	1,656	1,887
(Daily Average)	810	666	937	119	115	137	295	292	418	447	434	611	48	53	61
Percent Yield from Crude	41.0	34.8	36.7	6.4	7.0	6.1	15.9	17.7	18.5	24.1	26.3	27.0	2.6	3.2	3.1
Production, Jan.-Mar.	73,392	59,223	81,351	12,063	9,856	12,224	28,717	27,088	34,737	40,623	38,015	53,824	4,334	4,696	5,426
(Daily Average)	815	658	894	134	110	134	319	301	382	451	422	592	48	52	60
Appalachian															
Production, March	2,026	1,849	1,946	288	357	343	443	623	527	660	939	806	502	493	562
(Daily Average)	65	60	63	9	12	11	14	20	17	21	30	26	16	16	18
Percent Yield from Crude	45.6	38.9	40.7	6.6	7.7	7.3	10.2	13.4	11.3	15.2	20.2	17.2	11.5	10.6	12.0
Production, Jan.-Mar.	5,930	5,407	5,967	865	1,000	971	1,304	1,709	1,593	2,037	2,969	2,313	1,412	1,360	1,470
(Daily Average)	66	60	66	10	11	11	14	19	18	23	33	25	16	15	16
nd., Ill., Ky.															
Production, March	10,575	9,439	11,783	1,072	1,141	1,230	2,051	3,047	2,870	3,860	5,010	4,833	315	410	467
(Daily Average)	341	304	380	34	37	40	66	98	93	125	162	156	10	13	15
Percent Yield from Crude	50.7	41.0	47.0	5.4	5.2	5.2	10.4	14.0	12.3	19.5	23.0	20.5	1.6	1.9	2.0
Production, Jan.-Mar.	30,589	28,798	34,381	3,113	3,469	3,648	6,120	9,035	8,274	11,545	15,703	14,891	941	1,186	1,345
(Daily Average)	340	320	378	35	39	40	68	100	91	128	174	164	10	13	15
Okla., Kans., Mo.															
Production, March	5,793	4,582	5,414	701	778	669	1,168	1,732	1,578	1,898	2,398	1,920	312	350	399
(Daily Average)	187	148	175	23	25	22	38	56	51	61	77	62	10	11	13
Percent Yield from Crude	53.0	39.9	46.0	6.9	7.4	6.2	11.4	16.4	14.7	18.6	22.8	17.9	3.1	3.3	3.7
Production, Jan.-Mar.	16,104	13,587	16,104	1,831	2,279	2,159	3,361	5,182	4,304	5,264	6,723	5,632	873	857	1,056
(Daily Average)	179	151	177	20	25	24	37	58	47	58	75	62	10	10	12
Rocky Mountain															
Production, March	1,424	1,209	1,432	74	70	69	206	288	338	649	768	926	12	14	16
(Daily Average)	46	39	46	2	2	2	7	9	11	21	25	30	0.4	0.5	0.5
Percent Yield from Crude	52.8	42.6	42.3	2.9	2.6	2.1	8.0	10.6	10.2	25.2	28.2	27.9	0.5	0.5	0.5
Production, Jan.-Mar.	4,193	3,910	4,355	210	224	191	601	868	1,052	1,804	2,399	2,865	51	65	73
(Daily Average)	47	43	48	2	2	2	7	10	12	20	27	31	0.6	0.7	0.8
California															
Production, March	7,036	7,267	9,442	208	426	320	2,328	2,540	1,988	6,919	10,137	11,767	160	261	298
(Daily Average)	227	234	305	7	14	10	75	82	64	223	327	380	5	8	10
Percent Yield from Crude	34.7	29.2	38.4	1.3	2.0	1.3	14.0	12.0	8.1	41.7	47.7	47.9	1.0	1.2	1.2
Production, Jan.-Mar.	19,756	20,900	27,145	500	952	1,089	6,973	6,952	6,394	20,522	30,234	34,721	667	735	890
(Daily Average)	220	232	298	6	11	12	77	77	70	228	336	382	7	8	10
Total United States															
Production, March	51,950	45,001	59,059	6,033	6,326	6,878	15,326	17,288	20,269	27,858	32,700	39,180	2,813	3,184	3,629
(Daily Average)	1,676	1,452	1,905	195	204	222	494	558	654	899	1,055	1,264	91	103	117
Percent Yield from Crude	43.4	35.8	43.2	5.4	5.6	5.0	13.8	15.4	14.8	25.1	29.2	28.6	2.5	2.8	2.7
Production, Jan.-Mar.	149,964	131,825	169,303	18,582	17,780	20,282	47,076	50,834	56,354	81,795	96,043	114,246	8,278	8,899	10,260
(Daily Average)	1,666	1,465	1,860	206	198	223	523	565	619	909	1,067	1,255	92	99	113

* Production includes straight run, cracked, and natural blended at refineries. Yield indicates percent of crude runs made into straight run and cracked gasoline.

A-C Production Equipment

Allis-Chalmers Model E Double Drum Spudder and Well Servicing Unit. Maximum line pull 58,970 lbs. Eight line speeds, Cross arm spudder. Tool strokes 27", 35", 43", and 55". Four drum sizes available.

SERVICING→

←PUMPING

Allis-Chalmers Model L Power Unit. Six cylinders. Piston displacement 844 cu. in. Torque 590 ft. lbs. Continuous operating range 600—1200 r. p. m. Fuel: Butane, natural gas, gasoline or distillate.

The advantages of one adequate source of supply—manufacturing, sales and service—are available to every user of well servicing equipment and power engines.

Cooper built Allis-Chalmers Winch Tractors, Skid Winches and Power Units are standard models designed exclusively for oil field service.

Their satisfactory performance is the sole responsibility of one world wide organization, with service representatives in every territory where oil is being produced for our war effort.

The complete line of Allis-Chalmers production equipment includes: Four single drum winch tractor models; Three double drum winch tractor models; Eight single drum skid winch models; Seven double drum skid winch models; Three skid type spudder models; Two tractor type spudders, and Five sizes of Power Engines. We will gladly submit detailed specifications.

FRED E. Cooper

Hale Station, TULSA, OKLAHOMA

PHONE 7191 BOX 1260

BRANCH: 2612 South Main St. Los Angeles

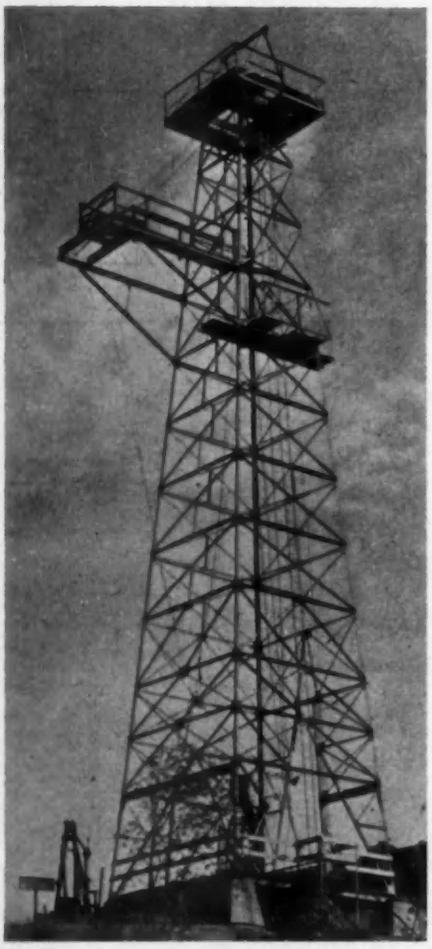
BRANCH: 1418 Franklin St. Houston

PRACTICAL OPERATING *Hints* FOR THE PRODUCTION MAN

$5.00 will be paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, *Houston*

1. WELL SERVICING

Derrick Platform Serves Offset Unit



Guyed over water table, bracketed platform takes load of servicing adjacent shallow well.

WHERE a field produces from two or more sands, and the wells for the different zones are adjacent, it is frequently possible to utilize the derrick over the deeper when servicing the shallow well.

One company solved the servicing problem for a shallow well by revamping the derrick on the deep well, constructing or erecting a supplementary water table or operating platform at the side of the derrick, supporting it by diagonal braces to the main structure, and taking the pull of the servicing tackle through guys carried to the top of the derrick.

The platform for the shallow well is completely outside the main derrick, and thus does not interfere with servicing of this unit, while at the same time placing the shallow-well crown block directly over the well bore and providing straight-line pulling of rods and/or tubing.

Access to the auxiliary platform is via the usual ladder on the derrick, over a narrow walkway built along one of the lateral members of the structure.

2. TIE-DOWNS

Demountable Anchor With Wide Range

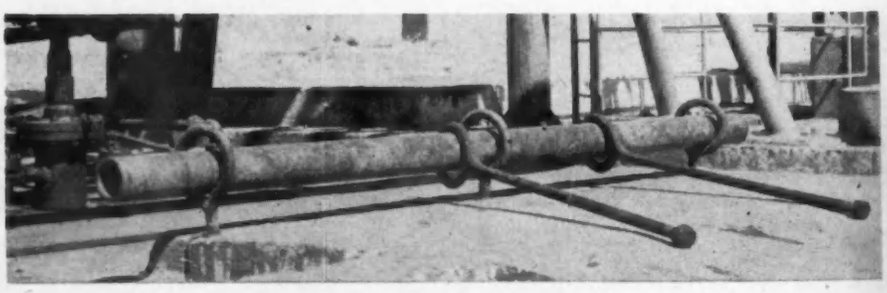
FOR tying down any size or type of pulling machine or well servicing unit, an adjustable anchoring unit can be made and installed when the machine ramp is poured at the side of the concrete derrick floor. Three large eyebolts are set in the forms, having eyes large enough that a convenient length of 4 inch drill pipe can be slipped through them and removed as easily when required.

Two additional eyebolts having long shanks are provided which also have a long threaded section for running the retaining nuts as far down as necessary. The space between the outer embedded eyebolts and the center one is wide enough to provide sufficient latitude for moving the loose eyebolts to the required lateral position.

Tie-down slots in the rear cross member of the pulling machines can be matched with the loose eyebolts to adjust, not only for different width machines, but for slight mis-alignment when backing to the well.

Spacing of the three eyebolts is made wide enough so that the transverse section of drill pipe can bend enough to distribute the hold-down load across the entire span, instead of concentrating it on but one or possibly two of the bolts.

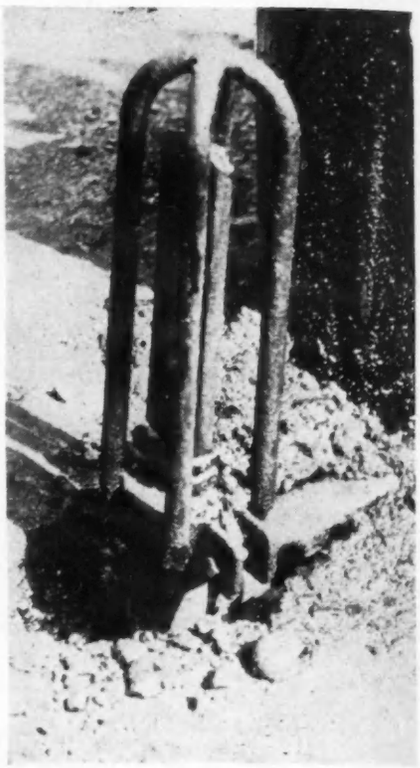
Provision of a short chain on the outer eyebolts, with a hook to engage the edge of the pipe, affords provision against gradual lateral shifting of the pipe under vibration, with possible consequent loosening of the unit and damage to the servicing equipment.



Working across the span between the three concreted eyebolts, the two long bolts accommodate any type of pulling unit and enable it to be securely anchored in place.

3. THERMOMETERS

Detachable Spider Protects Instrument



Welded as cross, then formed to clamp around fixture, this cage fends away possible damage.

PROTECTION is necessary if a thermometer is to be used in a socket let into a pipe at or just below ground level. This precaution, necessary for the bare stem of a removable thermometer, is even more imperative where the unit is of the permanent type, screwed or flanged to the line, with attached scale.

One such type of guard is made from two pieces of sucker or other heavy

THE WHOLE IS GREATER THAN ANY OF ITS PARTS

JUST AS *an unremovable auto tire might cause junking of an automobile, so it is with well control. Well control includes the proper equipment plus its adaptation to the steps employed in drilling a well, including a means to safely assemble and disassemble equipment when it has completed its job under complete mechanical control.*

★ **Gray Tool Company engineers devised Gray Systems of Well Control to utilize control equipment fully, then relegate to the position of an accessory, leaving the permanent structure completely balanced, compact, efficient and economical. That these systems are complete in their anticipation of the problems involved is attested by over 11,000 successful completions on land and water, with working pressures ranging up to 6700 lbs. per sq. in.**

GRAY
TOOL COMPANY
HOUSTON

West Coast Distributor: WAGNER-MOREHOUSE, INC., Los Angeles. *Export Representative:* GUY E. DANIELS, 30 Rockefeller Plaza, New York City

Casing Head Attached | Drilling | Running Casing | Casing Landed | Drilling Control Equipment Removed | Drilling-in and Running Tubing | Tubing Landed | Control Equipment Removed | Manifold Attached

KEEP YOUR WELL CONTROL and COMPLETION OPERATIONS OUT OF THE RED . . .

BROWN OIL TOOLS INC. BOT HOUSTON TEXAS

Call BROWN

Houston • Corpus Christi • Lake Charles
New Iberia • Houma

PAGES 3079 THRU 3098
IN THE 1943-44
COMPOSITE CATALOG

Be100%
with your
10%
☆
Buy WAR BONDS

scrap rod, welded at the centers to form a cross. The arms of this cross are then bent to form four parallel ribs, the spacing being such as to conform closely to the clearance required by the thermometer. Each pair of ends is welded to a formed piece of strap, having a locking flange and paired bolt holes so that the entire unit may be clamped firmly around the base of the fitting in which the temperature indicator is carried.

By setting the thermometer so that the scale appears between any adjacent pair of arms, the guard does not interfere with reading the instrument, yet it affords protection against anything but a flying missile, and insures the unit being given clearance by men working in the vicinity.

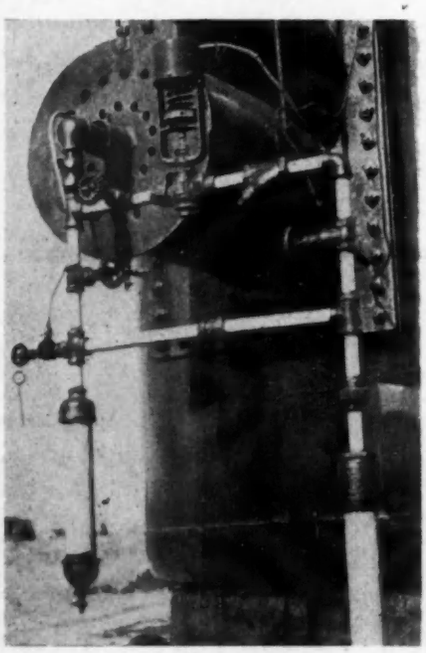
4. HEATER CONTROL

Large Drip Prevents Condensate Slugging

TYING in the pilot line lead from the end of the bypass providing fuel for hand firing a treating heater in case of derangement to the thermostatic control provides a comparatively long horizontal run of pipe with slow progress of the gas through the line. Such a unit, especially during cold weather or relatively cool nights, may act as condenser or accumulator for condensate which, slugging through the pinched valve of the pilot light, may extinguish the light and result in the accumulation of dangerous gas mixtures within the heater.

One company removes the usual small drip pot placed at the cross in the bypass line, substituting a collector formed from two reducing fittings and a 12-inch nipple of 2-inch pipe. Such a drip provides ample capacity for condensate collection and, being tied in to the bottom opening of the cross, is sure to intercept any fluid which may be carried through the run by the moving column of gas.

Draining of the pot is by means of a petcock set into the bottom reducer, the valve being opened only enough to permit the gas pressure to expel the trapped fluid without causing a sudden drop which might snuff out the pilot flame.



Pipe nipple and reducers make pot with capacity ample for all fluid from fuel gas flow.

5. GROUND UPKEEP

Mobile Hand Harrow Clears Fire Breaks

Welded up from scrap materials, this one-man unit breaks up growth with minimum effort.

CONTROL of vegetation on well grades and adjacent to firewalls is very necessary to provide a firebreak as well as to keep a band of loose, friable material adjacent to oil areas to absorb possible leakage. To conserve manpower and enable one man to handle a harrow or heavy rake too bulky for normal use, one company designed a wheeled unit which adequately breaks up the surface, destroying incipient vegetation, and covers a 30-inch swath at each passage over the ground.

The unit consists of a 1-inch pipe axle of the desired length, with stub spindles welded at the ends to carry two wheels—in the instance shown, salvaged from a rubber-tired toy. The teeth are made from ½-inch bolts, forged to a long point, and welded at 2-inch intervals to the axle. The handle is a 5-foot length of ¾-inch pipe, bent so as to allow the teeth to dig into the ground, and carrying light rod braces to the axle near the points of wheel attachment.

With slightly curved teeth, formed a little longer than the radius of the supporting wheels, the unit scarifies a strip of earth 30 inches in width, and may easily be pulled by one man and guided close to concrete aprons, fence lines or other points where the vegetation must be controlled.

Program Is Announced for Petroleum Division AIME

The regional meeting and annual spring meeting of the Petroleum Division, AIME has been set for May 8, 9, and 10, at the Rice Hotel, Houston. On the program, announced this week, will be Chester Alan Fulton, president of the institute for 1944. Fulton who is president of Southern Phosphate Company, an associate company of Davison Chemical Corporation, Baltimore, Maryland, will speak at the general session, Monday, May 8, on "Highlights of the World's Phosphate Mining."

Petroleum technology sessions take up Tuesday, May 9, and Wednesday, May 10, with the following papers: "Bureau of Mines Flow Tests on Gas Condensate Wells," by R. E. Heithecker and Kenneth Eilerts, United States Bureau of Mines; "An Engineering Study of the La Fitte Field, Louisiana," by Harold Vance, Texas A. & M. College; "Factors Involved in Estimating Results of Pressure Maintenance Programs," by L. E. Elkins and A. W. Walker, Stanolind Oil & Gas Company; "Recent Trends in Kansas Petroleum Economics," by Joseph A. Kornfeld.

"Behavior of Shut-In Wells," by P. T. Amstutz, Jr., and E. A. Stephenson, University of Kansas; "Analyses of Material Balance," by Morris Muskat, Gulf Research & Development Company; "Application of The Electric Pilot to Well Completions, Acidizing and Production Problems in the Permian Basin," by Phil S. Lehnhard and C. J. Cecil, Dowell Incorporated; "An Introductory Discussion of the Reservoir Performance of Limestone Formations," by A. C. Bulnes and R. N. Fitting, Shell Oil Company, Inc.; "Decline Curve Analysis," by J. J. Arps, British-American Oil Producing Company; "Significance of Declining Productivity Indices," by C. V. Millikan, Amerada Petroleum Corporation, and H. F. Beardmore, Barnsdall Oil Company; "Color Tests in Core Analysis," E. R. Philipp, The Atlantic Refining Company; "Experimental Determinations of the Water Vapor Content of Natural Gas Up to Two Thousand Pounds Pressure," by R. L. Huntington, University of Oklahoma; "Use of Modified Starch in Gulf Coast Drilling Mud," by G. R. Gray, Baroid Sales Division, National Lead Company; "Positive Colloid Muds for Drilling Through Heaving Shale," by D. C. Bond, The Pure Oil Company; "Well Cementing," by Ray S. Kail, Baker Oil Tools Incorporated, and B. C. Craft, Louisiana State University; and "The Quantitative Approach in Petroleum Engineering," by H. H. Power, The University of Texas; "Production Characteristics of Limestone Fields in Mexico," by Paul Weaver, Gulf Oil Corporation.

H. L. Johns New Head of Oil Scouts Association

H. L. Johns, Freeport Sulphur Company, New Orleans, was elected president of the National Oil Scouts and Landman's Association at the twentieth annual convention held at Dallas April 24-25. He succeeds Dell J. Crosby, Humble Oil & Refining Company, Houston, who becomes chairman of the board of directors.

Troy Stalls, Stanolind Oil Purchasing Company, Midland, Texas, and T. H. Robinson, Phillips Petroleum Company, Evansville, Indiana, were elected first and second vice presidents, respectively; and J. L. Smith, Pure Oil Company, Wichita, Kansas, secretary-treasurer. Howard R. Brooks, Magnolia Petroleum Company, Dallas, was nominated editor-in-chief of the Year Book.

Illinois Society Elects

The Illinois Geological Society elected the following officers for the coming year at a recent meeting: Fred H. Moore, Magnolia Petroleum Company, Mt. Vernon, Illinois, president; Lee C. Lamar, Carter Oil Company, Mattoon, Illinois, vice president; Everett F. Stratton, Schlumberger Well Surveying Corporation, Mattoon, secretary treasurer.

At the same meeting, John E. Adams spoke on "Depth Control of Sedimentation in the Permian Basin."

API Kilgore Meet

The East Texas Chapter, American Petroleum Institute, Division of Production, will hear a paper on "Factors Involved in Designs of Long Strings of Casing, Preparation and Use of Casing Selection Charts," by Herb M. Cooley, at the May 2 meeting, at Kilgore. Bert E. Hull is also scheduled to talk on the "Big-Inch Pipe Line."

Millikan Is Speaker

V. Millikan, chief engineer, Amerada Petroleum Corporation, Tulsa, Okla., was one of the principal speakers at the final business session of the Petroleum Accountants Society of Oklahoma for the fiscal year which was held last week in Tulsa.

Millikan spoke on "Bottom-Hole Pressures and Their Application to Operations of Oil Wells and Oil Pools."

Pipe Line Review

Texas Pipe Line Company Project Given Approval

The Texas Pipe Line Company has received approval of its projected 7.6 miles of 6⅝-inch pipe line from the Delacroix pool, Plaquemines Parish, Louisiana, to the Mississippi River. This line will replace the barge line to the pool and means building a loading dock so tankers can be loaded directly.

Contract has not been let but construction will start May 15 and be completed July 1.

Capacity of Fullerton Field Outlet Increased

Magnolia Pipe Line Company has increased capacity of its pipe line outlet for the Fullerton field, Andrews County sector of West Texas, to 8000 barrels daily through the installation of an 8-mile 6-inch loop on the discharge end of its original 16-mile 4½-inch that has been in service since December, 1942. The line ties into the company's double 8-inch system at Andrews station.

Lockport-East Chicago Line Completion June 15

The Texas Pipe Line Company expects to complete by June 15 the 34 miles of 6-inch petroleum products line from Lockport, Illinois to East Chicago, Indiana. This line will permit petroleum products to be shipped by lake tanker or tank car into District 1 and other areas. Morrison Construction Company has the construction contract.

Oklahoma Lines Handle Half of Loudon Production

A review of operations from 1938 to date of the Oklahoma Pipe Line Company's activities in the Loudon oil field reveals that the system so far has gathered and transported more than 57,000,000 barrels of the total of 102,000,000 barrels produced by that Illinois field up to March.

At present the Oklahoma Pipe Line system, which handles all of Carter Oil Company's Loudon productoin, is connected to about 340 leases in that area and gathers more than 25,000 barrels per day. It operates approximately 135 miles of gathering lines from 4 to 10 inches, 16 miles of trunk lines, and operates storage at Brownstown where oil is delivered for movement to Eastern points.

Phillips Considering Line From Hugoton to Wichita

Construction of a 24- or 26-inch pipe line from the Hugoton and Panhandle fields of Kansas and Oklahoma to Wichita and Kansas City is under consideration by Phillips Petroleum Company.

Application by Kansas Consolidated Gas Corporation for authority to lay a 215-mile 18-inch line from the Stephens County district of the Hugoton gas field to Wichita, is pending before the Federal Power Commission.

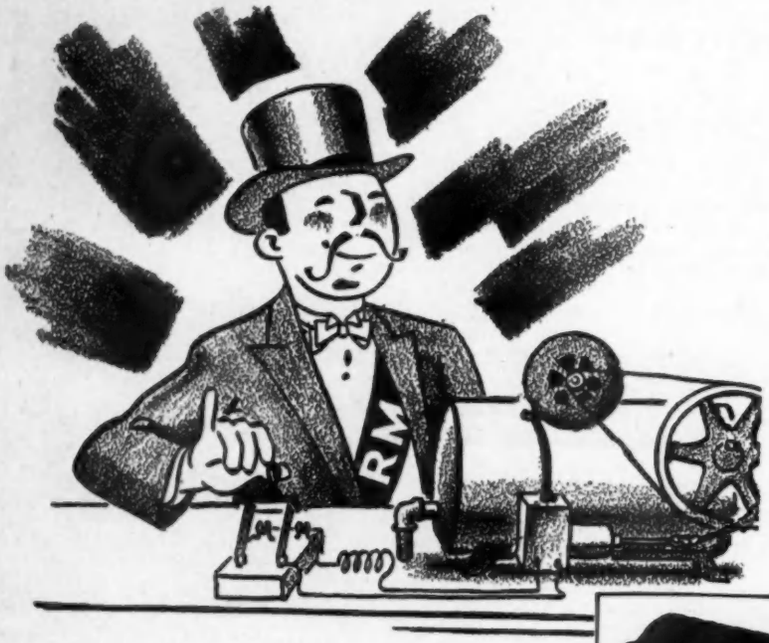
A 26-inch 230-mile welded gas line from Hugoton to Blackwell, Kan., is now being operated by Cities Service Transportation and Chemical Company, and is delivering 140,000,000 feet of gas per day into Kansas City.

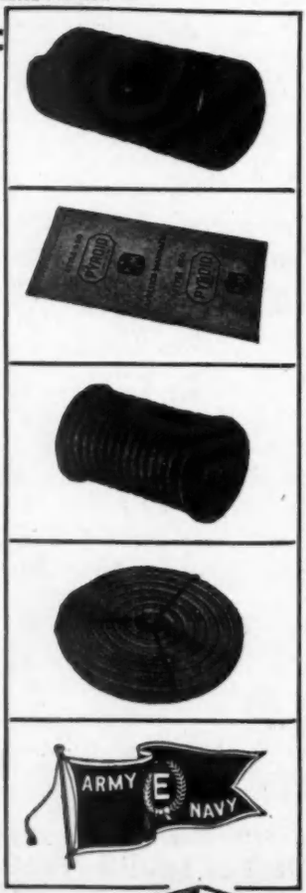
Drumright Rack to Take Over Shipments Shortly

Tank car shipments of West Texas crude oil from Atlantic Pipe Line Company's Midland rack to refineries in the Middle West and East averaged 42,000 barrels daily during the first 25 days in April. Total movement amounts to 4,505,000 barrels since this facility became available late in November, 1943, through Defense Plant Corporation absorbing the difference between pipe line and rail rates. The Midland rack has handled a peak of 60,000 barrels daily, 15 plants being supplied with all, or a portion of their requirements. Deliveries during April will average 20,000 barrels daily to Pittsburgh, thence by pipe line to Atlantic Refining Company's plant at Philadelphia; 10,000 barrels daily to the Everett, Massachusetts, plant of Colonial Beacon Oil Company, while the largest single consignment to Middlewestern refineries involves 6500 barrels daily to Globe Oil & Refining Company at Lemont, Illinois.

Rail movement from the Midland

R/M PACKINGS KEEP FLUIDS FLOWING





The life-blood of many finished materials of war is the basic fluids that are a vital part of the manufacturing process. Oils, acids, alkalis, solvents, etc., require very special packings in pumps and lines to withstand chemical attack and keep fluids flowing.

There are specific R/M Packings engineered to meet each of these conditions—to stand up under them and deliver many extra hours of efficient service. For the present, R/M production is available on a priority basis only, but we look forward to the time when we can again serve the great peacetime demands of every branch of American industry.

INDUSTRIAL SALES DIVISION
RAYBESTOS-MANHATTAN, INC.
MANHEIM, PA.
BRIDGEPORT, CONN. NORTH CHARLESTON, S. C. PASSAIC, N. J.
Makers of Packings for Every Industrial Use

rack is scheduled to be discontinued shortly after May 1 when Stanolind Pipe Line Company places in service a rack near the Drumright, Oklahoma, terminus of its 16-inch carrier from the Slaughter field. This shift in rail loading point will mean 3 days saving in turnabout time of cars. The rail tariff from Midland to Pittsburgh is 47 cents as compared to 35 cents from Drumright.

Michigan Line

Simrall Corporation will build 17 miles of 6-inch pipe line from the East Norwich field, Missaukee County, Michigan, south to Leonard Pipe Line Company's Aetna-Prosper main-line station. Gentry Engineering Company was awarded the construction contract.

Optimistic View of U. S. Oil Resources Expressed

Too much anxiety over adequacy of the nation's oil resources is not justified, in the opinion of Standard Oil Company (New Jersey) as stated in the company's annual report for 1943. At present, it is pointed out, "exploratory drilling is handicapped by wartime shortages of equipment and manpower and by a ceiling price for oil which frequently does not cover the costs of replacing the reserves sold."

"Once conditions are again favorable, we can look to additional discoveries of oil not only in this country but throughout the world. By every indication, reserves in foreign fields greatly exceed those in this country.

"Furthermore, there are almost limitless supplies of oil in oil shales, tar sands deposits, and particularly in coal, of which this country has tremendous reserves, and the techniques for obtaining oil from such sources are known and being steadily improved. We are confident this country will never face a shortage in liquid petroleum products if conditions favorable to the discovery of oil and to the development of synthetic substitutes are encouraged."

Total production of Standard Oil Company (New Jersey), domestic and foreign, averaged 697,280 barrels a day in 1943, a greater output than in any previous year except 1941, when production in the Netherlands East Indies was included.

Domestic production of the affiliates of the company averaged 347,700 barrels daily (gross) in 1943, 36 percent above their previous peak output of 255,293 barrels daily in 1941. Production of the company's foreign affiliates averaged 349,580 barrels daily, about 25 percent above 1942 but materially short of the 1941 peak of 455,521 barrels a day. The gain over 1942 mainly reflected a gain of 63,000 barrels a day in Venezuelan production. Gross production of foreign affiliates operating in Canada, Colombia, and Peru increased over 1942 but output of affiliates in Argentina showed a decline.

World-wide crude runs of refineries of affiliated companies averaged 874,582 barrels daily in 1943, about 20 percent more than in 1942. The domestic refineries of company affiliates refined 467,190 barrels of crude per day—more than ever before in their history. The previous high was 453,821 barrels daily in 1941. The foreign refineries of company affiliates processed 407,392 barrels of crude per day, as compared with 329,511 daily in 1942.

Ever Climb Down an Oil Well?

These Burmese natives are getting first hand information on pumping problems. Climbing down hand dug wells to scoop up oil in discarded tins, these *human pumps* know all about "corrosive action"... "temperature changes"... "fatigue limits"... and "wear resistance"—not to mention expense of "down time" when pumps must be pulled frequently. Axelson knows about these things, too—and has devoted half a century to solving the pumping problems of oil operators everywhere. The Burmese native's knowledge stops at 500 feet; but Axelson has always set the pace for deeper and deeper wells. Originating and pioneering the modern interchangeable liner pump has been only one step in Axelson's development of new and better pumping equipment. The enviable record of long, trouble-free service and high production under widely varying conditions the world over, is indisputable proof of Axelson quality.

THE SUN NEVER SETS ON AXELSON PUMPS

AXELSON MANUFACTURING COMPANY

Post Office Box 98, Vernon Station, Los Angeles 11, Calif.

50 Church Street, New York City 7 • 3844 Walsh Street, St. Louis 16, Missouri • 1503 National Bank of Tulsa Bldg., Tulsa 1, Oklahoma • Mid-Continent and Eastern Distributor: JONES & LAUGHLIN SUPPLY CO. • Rocky Mountain Distributor: GREAT NORTHERN TOOL COMPANY • Foreign Distributor: AXELSON MANUFACTURING COMPANY—Avda. Pte., R. Saenz Pena 832, Buenos Aires, Argentina • INDUSTRIAL AGENCIES, LTD., 7 High St., San Fernando, Trinidad, British West Indies—C. C. McDERMOND, Apartado 331, Maracaibo, Venezuela.

AXELSON

MANUFACTURES AND *SERVICES*

DEEP WELL PLUNGER PUMPS

AND SUCKER RODS

Refinery Runs Off; Stocks Of All Main Products Cut

Evidence of scarcity permeated latest weekly statistics of the industry, covering the 7 days ended April 22. Crude-oil production declined a little and crude runs to stills were off substantially, with the result that there were decreases in production of principal products and withdrawals of them from storage.

Crude-oil production of 4,427,000 barrels daily was 5000 lower than in the previous week, although 520,000 daily or 13.3 percent higher than the 3,907,000 barrels of output in the like week last year.

Runs to stills averaged 4,390,000 barrels per day, down 57,000 from the near-record runs of the previous week but 647,000 barrels or 17.3 percent above the runs of 3,743,000 barrels daily in the week ended April 24 last year.

Stocks of crude oil were almost stationary in the week ended April 15, and the 234,188,000 barrels on hand that date represented 7,000,000 barrels or 3 percent less than the 241,421,000 barrels held April 17 last year.

Production of gasoline was 50,000 barrels a day lower in the week ended April 22 than in the preceding week, having averaged 1,919,000 barrels daily. That was 425,000 barrels a day or 28.5 percent more than production in the on similar sharp expansion of gasoline demand. Stocks of finished and unfinished gasoline were reduced at the seasonally low rate of 7000 barrels like week last year, an increase based daily and totaled 88,729,000 barrels April 22. That total was only 2,022,000 barrels or 2.2 percent less than the 90,751,000 barrels held on April 24 last year. At the beginning of the week the stocks were 3,297,000 barrels or 3.6 percent under the year-ago trend.

Gas oil and distillate fuel oil production averaged 664,000 barrels daily in the week of April 22, an increase of 12,000 barrels in the daily average as compared with the previous week. The production was 92,000 barrels a day, or 16.1 percent greater than that in the like week last year. Stocks of these oils, although normally on the increase at this time of the year, were reduced nearly 10,000 barrels daily. They totaled 30,495,000 barrels on April 22—almost the same as on the corresponding date last year.

Residual fuel oil production declined and a large draft on stocks resulted. Output averaged 1,222,000 barrels daily, or 55,000 a day less than in the previous week, although 69,000 daily or 6 percent more than production in the corresponding week last year. Stocks of residual fuel were drawn upon to the extent of 94,000 barrels daily, having been reduced to 51,061,000 barrels. That quantity was 18,433,000 barrels or 26.5 percent less than the 69,494,000 barrels on hand April 24 last year.

Special Allowable Right To Be Tested in Courts

The first suit to determine the authority of the Texas Railroad Commission in setting special allowables for wells in an oil field is to be tried May 4. Mackhank Petroleum Company has brought suit against the commission contending that allowables assigned to wells in the Mission river bed are excessive. Two wells have been exempt from shutdown after showings were made that they produced large volumes of water if closed in at intervals. The plaintiff contends that the result has been to allow these wells to produce more than their share of the oil and against the method of proration which assigns allowables on a per-well basis.

Sunray Oil and Darby Companies to Merge

Terms for a merger of Sunray Oil Corporation and Darby Petroleum Corporation have been reached by officials and shareholders will meet to confirm the agreement which involves stock exchange. Sunray Oil Corporation recently acquired the properties of Superior Oil Corporation.

Crude Oil Production in the United States

(Estimates compiled by The OIL WEEKLY. All figures indicate daily averages, in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED April 29	April 22
Alabama	25	25
Arkansas	79,550	79,600
California	834,400	833,350
Colorado	8,200	8,500
Florida	45	45
Illinois	206,500	221,500
Indiana	13,850	14,000
Kansas	273,500	280,000
Kentucky	24,350	22,100
Louisiana	358,650	358,600
North Louisiana	76,150	76,050
South Louisiana	282,500	282,550
Michigan	48,500	52,550
Mississippi	43,900	42,500
Missouri	100	100
Montana	23,490	23,465
Nebraska	1,150	1,200
New Mexico	113,000	113,000
New York	13,750	13,700
Ohio	8,350	8,400
Oklahoma	334,100	331,750
Pennsylvania	41,700	41,550
Tennessee	30	30
Texas	1,910,200	1,910,650
Upper Gulf Coast	518,700	519,000
East Texas Field	362,000	362,500
Rest of Eastern Texas	127,500	127,300
Lower Gulf Coast	198,250	197,900
Southwest Texas	75,300	75,300
South Central Texas	19,650	19,900
West Texas	374,100	373,750
North Texas	143,700	144,000
Panhandle	91,000	91,000
West Virginia	8,700	8,600
Wyoming	98,700	88,650
Total United States	4,444,740	4,453,865

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

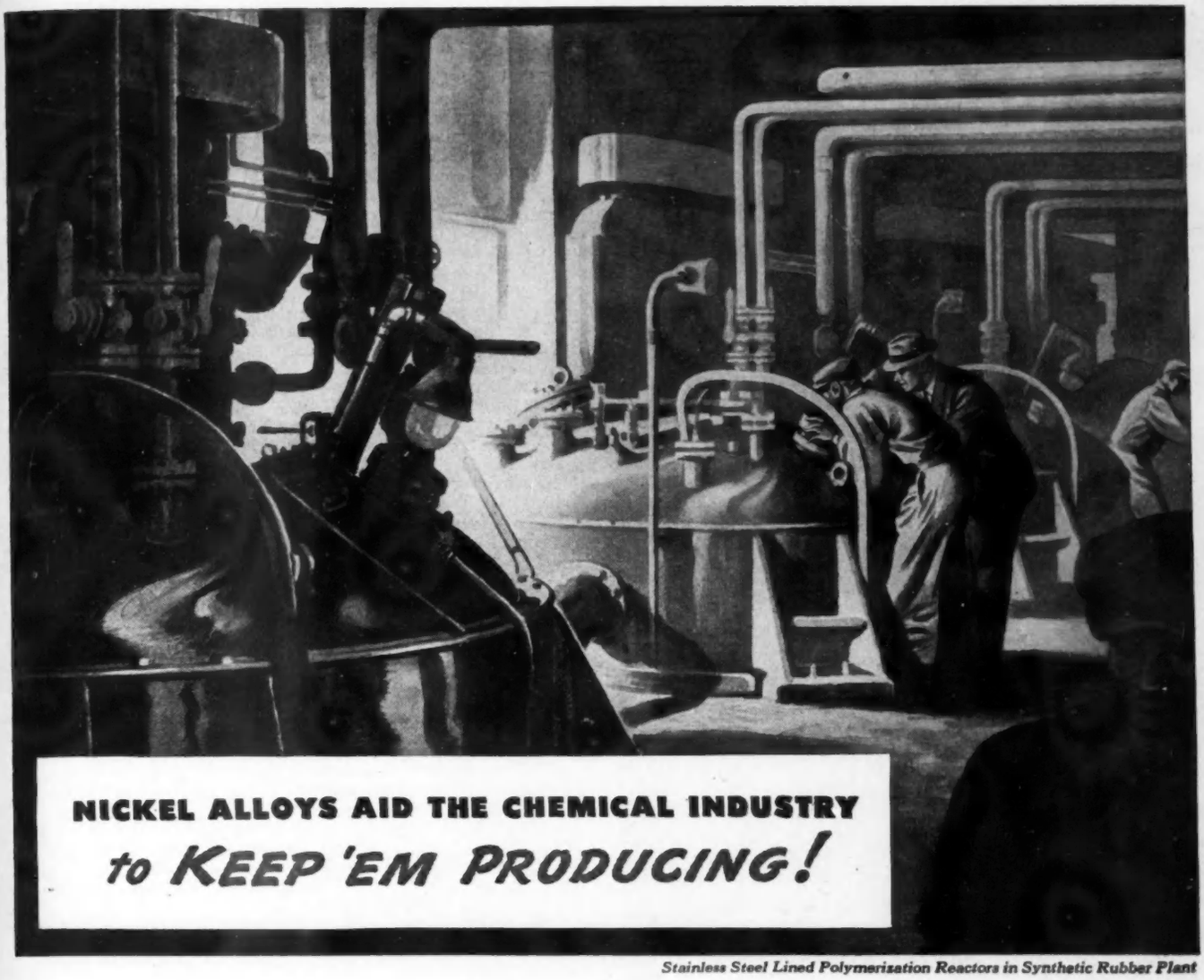
HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Week Ended	Runs to Stills Barrels Daily	Week Ended	Crude Stocks Barrels	Week Ended	Gasoline Stocks Barrels	Week Ended	Gasoil and Distillate Stocks Barrels	Week Ended	Residual Fuel Oil Stocks Barrels	Week Ended
Highs:												
1941	4,337	11-22	4,120	10-18	266,187	3-29	99,727	3-29	[5]54,983	11-15	102,448	1- 4
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	49,861	11-14	95,857	1- 3
1943	[1]4,436	11-13	4,331	12- 4	245,752	5-29	94,159	3-20	46,187	11-27	72,881	1- 2
1944	4,432	4-15	[1]4,453	1- 1	240,992	1- 1	89,162	4- 1	42,310	1- 1	57,330	1- 1
Lows:												
1939	[3]1,601	8-26	3,125	2-18	[2]229,127	10-12	71,152	10- 7	20,722	4-15	105,397	4- 8
1941	3,364	1-11	3,490	1-18	240,399	11-15	79,923	10- 4	28,381	4-12	90,914	7-12
1942	3,297	7- 4	3,393	5-23	231,896	12-12	75,934	12- 5	29,240	4-25	72,962	12-26
1943	3,821	1- 9	3,579	3-13	232,191	1- 9	68,182	10-16	30,732	4- 3	57,596	12-25
1944	4,357	1- 1	4,228	2-12	234,172	4- 8	76,302	1- 1	30,478	4- 8	51,010	3-18

TRENDS OF 1943 AND 1944

Trends in Week Ended:	Crude Oil Production Daily	Runs to Stills Daily	Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1943:									
January 2	3,871	3,734	233,938	10,957	82,420	4,285	42,913	7,683	72,881
January 30	3,826	3,698	233,863	10,339	88,830	3,888	37,057	7,452	70,763
February 27	3,873	3,709	235,217	10,566	93,157	4,230	32,939	7,839	70,140
March 27	3,896	3,742	239,126	10,231	94,079	3,541	30,980	8,018	67,938
April 24	3,913	3,737	242,035	10,583	91,001	3,954	31,142	8,168	67,455
May 29	3,970	3,679	245,752	10,656	83,937	3,798	32,274	7,672	67,682
June 26	3,955	4,015	242,657	11,092	79,589	3,876	34,044	8,126	67,960
July 31	4,133	3,788	238,420	11,127	74,977	3,765	36,363	8,478	66,877
August 28	4,196	4,227	236,170	12,420	72,525	4,351	37,928	8,732	67,250
September 25	3,344	4,156	233,013	12,206	70,024	4,608	40,328	8,560	66,659
October 30	4,383	4,176	237,219	12,813	69,297	4,642	44,591	7,968	63,833
November 27	4,414	4,261	239,761	12,638	69,980	4,379	46,187	8,633	62,143
December 25	4,363	4,185	241,310	12,597	74,024	4,457	43,791	8,689	57,596
1944:									
January 1	4,357	[1]4,453	240,992	13,192	76,302	4,575	42,310	9,141	57,330
January 29	4,409	4,359	240,251	13,427	81,085	4,054	37,266	8,889	52,857
February 26	4,423	4,377	237,137	13;183	85,248	4,558	33,766	8,952	51,387
March 25	4,385	4,443	236,285	13,362	87,287	4,979	31,319	9,013	51,669
April 1	4,383	4,435	234,667	13,824	89,162	4,450	30,530	8,367	51,326
April 8	4,416	4,354	234,172	13,161	88,100	4,702	30,478	8,541	51,072
April 15	4,432	4,447	234,188	13,784	88,778	4,565	30,561	8,933	[5]51,714
April 22, 1944	4,427	4,390	.....	13,433	88,729	4,649	30,495	8,552	51,061
April 24, 1943	3,907	3,743	[4]241,421	10,453	90,751	4,005	30,838	8,070	69,494
Change:									
In week	—5	—57	+16	—351	—49	+84	—66	—381	—653
In year	+520	+647	—7,233	+2,980	—2,022	+644	—343	+482	—18,433
In year	+13.3%	+17.3%	—3.0%	+28.5%	—2.2%	+16.1%	—1.1%	+6.0%	—26.5%

[1] All time peak. [2] Lowest since April, 1922. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent States. [4] Stocks, April 17, 1943. [5] Revised.



NICKEL ALLOYS AID THE CHEMICAL INDUSTRY

to KEEP 'EM PRODUCING!

Stainless Steel Lined Polymerization Reactors in Synthetic Rubber Plant

Equipment of Stainless Steel, Nickel and Monel meets many specialized requirements

Chemical engineers have met America's wartime challenge.

They opened the gates to a mighty flood of products going to war... strategic raw materials, synthetic substitutes, and entirely new substances having advantages all their own.

A factor in this production success is the wide use of stainless steel, Monel, and other corrosion-resistant alloys containing Nickel.

For in the chemical industry corrosion is a large-scale menace.

To wage war on this enemy, chemical engineers enlisted the aid of Nickel, because Nickel imparts to other metals strength and resistance to corrosion and wear. In the chemical field, as in many others, a little Nickel goes a long way to keep equipment producing.

It prolongs the life of processing apparatus, and protects the purity, color, and uniformity of the product.

Hence, stainless and Nickel alloys are specified widely for acid heaters and caustic coolers, for high-pressure autoclaves and vacuum evaporators, for cracking towers and polymerization reactors, for shipping drums and tank cars, for pumps, piping and storage tanks, for agitators and settlers, for stills and digestors—for every type of equipment that converts laboratory experiments into full-scale chemical operations.

For years we have enjoyed the privilege of cooperating with technical men of the chemical industry... and of many others. Whatever your industry may be ... if you want help in the selection, fabrication, and heat treatment of alloys ... we offer you counsel and data.

New Catalog Index

New Catalog C makes it easy for you to get Nickel literature. It gives you capsule synopses of booklets and bulletins on a wide variety of subjects—from industrial applications to metallurgical data and working instructions. Why not send for your copy of Catalog C today?

* Nickel *

THE INTERNATIONAL NICKEL COMPANY, INC., *67 Wall St., New York 5, N. Y.*

BOTH *Grip* TIGHT
AND *Hold* FAST

. . because both are based on the SPIRAL Principle

Supremacy of the GUIBERSON SPIRAL PACKER is based on a principle as simple as A-B-C, and as logical as the multiplication table. At the proper level, the spiral is collapsed, making a screw-right contact with the formation. Available in tubing packers, casing packers, standard plugs, collapsible plugs and washdown plugs.

THE GUIBERSON CORPORATION
DALLAS, TEXAS
Export Representative: I. FRANK BROWN
30 Rockefeller, Plaza, New York City
Calif. Distributor: W. R. GUIBERSON CO.
723 East Gage Ave., Los Angeles, Calif.

Now supplying critical materials to the Army, Navy, Marines and Army Air Forces

GUIBERSON
LIFE EXTENSION SERVICE FOR OIL WELLS

Canada's Second Deepest Wildcat Reaches Limestone for Test

Royalite Oil Company's Wildcat Hills in lsd 16 30-27-5w, second deepest wildcat yet drilled in Canada, and the first well in the Central Alberta Foothills Belt to ever reach the Madison (Palaeozoic) limestone, drilled into the top of the Madison at 11,078 feet, and halted at 11,098 feet.

Some porosity was indicated in cuttings from the top of the lime, but as oil was being used for drilling, no accurate data on lime contents was available. The plug is to be drilled out after which the hole will be geophoned, and initial limestone cores will be taken.

Madison elevation at Wildcat Hills 1 is 6486 feet below sea level. This is 777 feet higher than the Madison elevation at Shell-Norman 1, located in the north part of the South Alberta Foothills, 20 miles south of the Royalite well. Shell-Norman 1 reached the Madison at 11,588 feet, 7263 feet below sea level, and drilled to 12,056 feet. Some gas, plus sulphur water, showed in the lime, and it was abandoned.

Canada's deepest producer of water-free oil is the Northend Petroleums No. 1, located on the "East Side Limestone" of Turner Valley, 25 miles south and east of Shell-Norman 1. Northend 1 completed at 9612 feet, 5614 feet below sea level, is currently producing about 250 barrels of oil daily.

The deepest well drilled on Turner Valley "East Side" is Foothills 13, drilled to 10,457 feet, 6434 feet below sea level. This well encountered oil in the top of the lime but drilled into water, and was abandoned after producing a small volume of oil.

The oil-water line along the west flank of Turner Valley ranges from 4000 to 4600 feet below sea level. Until the theory was blasted by completion of oil producers at much greater elevations on the east side of the field, geological opinion was largely along the line that little could be hoped for in the Foothills at locations where the Madison lime lay more than 4500 feet under sea level. That theory, together with high drilling costs, contributed in past years to the suspension or abandonment of a considerable number of South and Central Foothills tests, at depths to 8800 feet, without the Madison lime being reached.

The Shell well, however, continued to drill steeply pitched formation until the Fernie shale was entered, while Wildcat Hills penetrated relatively flat sections. As a result, Wildcat Hills gained 2170 feet, logged 777 feet higher than Shell-Norman at the Madison lime contact.

Following is a comparison of the logs of the two wells from the final Grit Bed on:

SHELL NORMAN No. 1		MARKER	ROYALITE-WILDCAT HILLS 1	
Lsd 5 22-24-5w5th Surf. Elev. 4325 ft.			Lsd 16 30-27-5w5th Surf. Elev. 4592.4 ft.	
Depth:	**Elevation:**		**Depth:**	**Elevation:**
8060 ft.	—3735 ft.	Grit Bed (UBL)	9270 ft.	—5128 ft.
Not present		Home Sand (LBL)	Not present	
10,687 ft.	—6362 ft.	Dalhousie sand	10,820 ft.	—6228 ft.
10,790 ft.	—6475 ft.			
11,380 ft.	—7055 ft.	Brown Sand	10,980 ft.	—6388 ft.
11,500 ft.	—7175 ft.	Fernie Shale	11,030 ft.	—6438 ft.
11,588 ft.	—7263 ft.	Madison Limestone	11,078 ft.	—6486 ft.
12,056 ft.	—7731 ft.	Final Depth	?	

Drilling Getting More Active in Colombia

Shell Oil Company of Colombia was testing San Angel 1 in the Magdalena Department on April 15, and was rigging up for Dificil 3 on its concession tract immediately south of the San Angel area. On the El Doce tract, further south, Shell spudded its second well on April 11, and was drilling below 600 feet a week later. In the Shell Casabe field No. 18 was nearing 4000 feet and No. 19 was drilling after setting surface pipe. In the Llanos, Shell's San Martin 1 was drilling and coring below 1600 feet on April 15, at a rate of nearly 100 feet per day.

In the mid-Magdalena Valley area Socony-Vacuum's Cantagallo 4 was waiting on equipment for testing. Cantagallo 5 was spudded on April 20. The same company has erected derrick and is moving in equipment for a test well in the Floresante tract, on the Sinu River. Seven well locations are being prepared by Socony-Vacuum Oil Company in the Socuavo field, in the Barco Concession. Socuavo 9 is rigging up, Socuavo 6 is waiting on equipment. Wells 7 and 8, after plug-backs, are both reported to have tested approximately 300 barrels daily of high-gravity oil. Socony-Vacuum has also been preparing locations for 6 more wells in the Tres Bocas area, and its Tres Bocas 5 was reported to be drilling at 2700 feet on April 17, with small hole.

U. S. Field Operations

Illinois Basin

Clay City Field Most Active During Week

The Clay City field, second oldest of Illinois' "new" pools, is now seven years old and is still going strong, last week being the most active pool in the state with approximately 20 operations.

Pure Oil Company opened the field with Weiler 1, SE SW SE 33-3n-8e, with a sand formation which produced 40 barrels per day on pump. The company named the producing formation Weiler but later discovered it was Cypress sand. It was only a short time after Weiler 1 was discovered that the same company made its second discovery in the area with Travis 1, NW SW NE 33-3n-8e. Travis 1 yielded 2650 barrels flowing in 24 hours from McClosky lime and started the boom.

Clay City is third largest in accumulated oil production of the state's new pools, being topped only by Salem and Loudon. It is 12 miles long and 6 miles wide and has had 760 wells completed, of which 700 are now producing a total daily average of 12,000 barrels. Pure Oil Company has been the principal operator in the pool since its discovery.

Douglas County: Ohio Oil Company has filed six more leases near the town of Tuscola to bring its holdings in the area to more than 7500 acres. The company plans to drill a well possibly 6000 feet when a block of acreage of sufficient size has been assembled.

Wayne County: Magnolia Petroleum Company's Shannon 1, NE NW NW 8-1n-5e, a wildcat test south of Xenia, is drilling below 3000 feet to test McClosky lime. Upper formations were dry.

Hamilton County: National Associated Petroleum Company is preparing to drill plug at its wildcat Dial-Braden 1, NW NW NE 17-6s-6e, for a test of McClosky lime at 3212-16 feet. It is bottomed at 3220 feet.

Hardin County: Northern Ordnance is cleaning out hole at Fricker 1, SW SE SE 30-11s-8e, at 2675 feet. Total depth is 2733 feet.

Jackson County: Magnolia Petroleum Company's Reuscher-Froemling 1, NW SE SW 11-7s-4w, a wildcat, is rigging tools.

Shelby County: Carter Oil Company has given up 210 oil and gas leases in Lakewood, Rose, Holland, Clarksburg, Tower Hill and Ridge townships. Most of the leases were acquired in 1936.

Clay County: Kingwood Oil Company is drilling below 2000 feet at Curshall 1, NW NW SE 14-3n-10e, south Olney and three miles from the nearest production.

Montgomery County: The Texas Company's Marine State Bank 1, NE NE SE 32-10n-3w, a wildcat which showed 8 quarts of oil per hour when plug was drilled to Trenton lime at 2641-2714 feet, is drilling deeper.

Indiana

Bennett Brothers have completed Schultz 1, SE SW SE 29-6s-14w, in Posey county, for an extension of the Upton pool. The well is about ¾ mile north of production. It initialed 50 barrels of oil on pump from Aux Vases sand at 2776-2801 feet, the latter figure plug-back total depth.

Kentucky

Miller and Schiarella have opened a new pool in Daviess County five miles south of the Birk City pool, at Simmons 1, 20-O-27. Producing from the Aux Vases sand at 1842-45, the well pumped 25 barrels in 24 hours on initial test. The pool has been tentatively named the St. Rapheal. Birk City pool was the one which started the new Kentucky oil play.

Calstar Petroleum Company has a freak well at Dyer-Higginson 1, 14-O-18 in Union County's Raleigh pool. When plug was drilled to test McClosky lime at 2815-20 feet, the well flowed 250 barrels in three hours and then was shut in for lack of storage. After storage was provided, the well was opened but refused to flow. After swabbing it finally made 10 barrels of oil per hour. Operators are debating whether to drill deeper or acidize and continue testing at the present level.

Exploratory Crews Are Numerous in Mississippi

During April Mississippi had 35 seismograph crews in operation, 15 gravimeter crews and several other groups employing other methods of exploration. During the same month there were 120 seismograph and gravimeter crews and 15 others operating in Texas, a compilation reveals.

Oklahoma

West Moore Operators Watch News from Capital

Two more locations for West Moore, Cleveland County, are announced by Mid-Continent Petroleum Corporation, discoverer of the pool, which is completing two producers while operators await news concerning disposition of the Navy's emergency air field east of the field. Indications are that the government will return the property to the original owners and stiff bidding for the mineral rights is expected.

West Edmond: Peppers Refining Company's Heidbrink 1, CNE SE 6-13n-3w, extended the field a quarter southwest. Hole was drilled to 7023 feet and pipe set at 6948 feet. While testing the well flowed through choke and was later pinched back to the field's 300-barrel daily allowable. Skelly Oil Company's Spivey 1, CNW SW 30-14n-4w, near the Canadian County line, topped Hunton lime at 6920 feet and was drilling at 6974 feet and running even with Dickey Oil Company's north offset.

McClain County: Carter Oil Company abandoned Johnson Ranch 1, CSW NE 13-8n-4w, after testing Hunton, Wilcox and Pennsylvanian with no shows. Total depth is 10,536 feet and apparently defines the Wilcox deep sand which the company's Cottingham 1, CSE SW 4-7n-3w, opened four miles southeast. Cot-

Wells Completed in the United States in Week Ended April 29, 1941

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS *Oil	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	Cumulative: This Year	Last Year
Alabama	....	....	....	....	....	....	....	....	1	1	1	....	2	.....
Arizona	....	....	....	....	....	....	....	....	....	....	....	....	3	.....
Arkansas	5	....	....	1	6	....	....	....	4	4	10	2	64	77
California	30	2	....	....	32	2	....	....	7	7	41	51	640	400
Colorado	....	....	....	....	....	....	....	....	....	....	....	....	9	8
Georgia	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Illinois	15	....	....	2	17	....	....	....	4	4	21	25	485	596
Indiana	3	....	....	1	4	....	....	....	3	3	7	....	90	84
Iowa	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Kansas	18	....	....	5	23	....	2	2	22	26	49	17	586	469
Kentucky	3	1	1	1	6	....	....	....	3	3	9	7	182	86
Louisiana	6	....	....	1	7	....	....	....	4	4	11	13	207	164
North Louisiana	1	....	....	....	1	....	....	....	1	1	2	5	61	65
South Louisiana	5	....	....	1	6	....	....	....	3	3	9	8	146	99
Michigan	4	....	....	1	5	1	....	....	5	5	11	10	184	145
Mississippi	....	....	....	....	....	....	....	....	2	2	2	3	35	25
Missouri	....	....	....	....	....	....	....	....	....	....	....	....	3	3
Montana	3	....	....	1	4	....	....	1	1	2	6	7	84	58
Nebraska	....	....	....	....	....	....	....	....	....	....	....	....	7	18
New Mexico	4	....	....	....	4	....	....	....	2	2	6	8	135	83
New York	15	....	10	....	25	....	....	....	....	....	25	25	420	356
Ohio	....	3	....	1	4	....	....	....	....	....	4	6	218	282
Oklahoma	24	3	....	6	33	....	....	....	4	4	37	26	491	437
Pennsylvania	26	5	15	1	47	....	....	....	....	....	47	47	893	776
Tennessee	....	....	....	....	....	....	....	....	....	....	....	....	3	1
Texas	65	....	....	16	81	6	3	....	24	27	114	96	1,792	1,184
E.Tex.Bor.Co.'s	....	....	....	....	....	....	....	....	....	....	....	....	4	6
E. Texas Field	....	....	....	....	....	....	....	....	....	....	....	....	1	2
Rest of E. Texas	1	....	....	....	1	2	....	....	3	3	6	5	97	67
North Texas	9	....	....	7	16	....	1	....	5	6	22	23	414	274
W. Central Tex.	6	....	....	2	8	1	....	....	2	2	11	4	127	102
West Texas	21	....	....	4	25	3	....	....	6	6	34	31	490	273
Tex. Panhandle	7	....	....	....	7	....	....	....	....	....	7	3	67	73
G. Coast, Upper	6	....	....	1	7	....	....	....	4	4	11	15	161	76
G. Coast, Lower	15	....	....	1	16	....	....	....	3	3	19	9	279	178
Southwest Texas	....	....	....	1	1	....	2	....	1	3	4	6	122	107
S. Central Texas	....	....	....	....	....	....	....	....	....	....	....	....	30	26
West Virginia	3	13	....	2	18	....	....	....	....	....	18	18	305	195
Wyoming	1	....	....	....	1	....	1	....	....	1	2	5	52	40
Total U. S.	225	27	26	39	317	9	6	3	86	95	421	365	6,890	5,490

* Includes distillate wells † Includes salt water disposal wells.

tingham 1 again squeezed perforations at 10,625-50 feet in another attempt to reduce water content. Last gauge gave the well 536 barrels of oil and 35 barrels of water through choke in 35 hours.

Washita County: A deep wildcat test in the southeast part of the county seems assured as Helmerich & Payne bid in seven tracts of state school lands centering around Township 8, Ranges 15 and 16 west. The sale carries a drilling obligation.

Carter County: Samedan Oil Company et al's Revelle 1-A, SE SE SE 21-3s-2w, in the Wheeler pool, established production in the Deese sand of the Pennsylvanian. With total depth 6502 feet, hole was cleaned out to 5156 feet, producing 14 barrels of oil in 12 hours on swab. Shot with 10 quarts and shut in, the well filled up with 3000 feet of oil in three days. Swabbed again, it made 15 barrels of oil an hour.

Garvin County: Continental Oil Company's Park 1, SE NE SE 28-4n-1w, Pauls Valley area, was drilling in shale below 3427 feet.

Marshall County: A large block southeast of Madill has been assembled by the Perfect Circle Piston Ring Company, which has located a Bromide test in the SWc 1-6s-4e.

Kansas

Wildcat Activity Greatly Intensified by Strikes

Recent important oil strikes have stimulated Kansas exploratory work with 10 core-drill machines, 8 seismograph crews and 2 gravitimeter parties reported at work in the east, west and central portions of the state. A total of 86 wildcats were drilling as against 63 a year ago.

Barton County: A new Arbuckle pool is reported 6 miles west of the Silica pool as W. L. Hartman's Powell 1, CW NW NW 1-20s-13w, swabbed 37 barrels of oil in 18 hours on initial test. Arbuckle was topped at 3427 feet, pipe set at 3425 feet, and when plug was drilled to 3464 feet the well flowed 2 million feet of gas with a spray of oil. Deepened to 3475 feet the flow increased slightly after which the well was plugged back to 3461 feet and acidized for the swab test.

Reno County: Falcon Seaboard Oil Company et al reported porosity and stains in the Lansing at 3513-60 feet in Miller 1, SW SW SW 26-25s-10w. Mississippian was logged at 3906 to 3918 feet, total depth, and the well is testing in the upper zone.

Trego County: Ohio Oil Company's Hamburg 1, CW NE NE 25-12s-21w, is an eastern extension to the Gugler pool, flowing 20 barrels of oil an hour on initial test from Arbuckle at 3930-40 feet.

Pratt County: Cities Service Oil Company's Barker 2, SW NW NE 23-28s-12w, Chitwood pool, is a dual completion flowing 8½ million feet of gas from Viola at 4300 feet and with a potential in the Simpson at 4407 feet of 1039 barrels of oil and 22 barrels of water.

EDWARD STEWART, 79, president of Stewart Oil Company, and Bay Pipe Line Company and vice president of Bay Refining Company, died at Mt. Pleasant, Michigan, April 20. Seven of his eight sons are serving in the Army and Navy.

West Texas

Keystone's Ellenburger Extension Is Confirmed

One-mile southeast extension for Keystone field's Ellenburger area was confirmed when Gulf Oil Corporation's Keystone 46-E, entered the Ellenburger gas-cap at 9250 feet, or 17 feet low to the discovery, and was drilling at 9305 feet. The company had rigged up for the drilling of a ¾-mile southeast and a mile southwest outpost on the strength of favorable structural position recorded by upper markers. Richardson & Bass' Walton 10-E, south offset to the discovery, flowed 1280 barrels of oil natural on 12-hour test through 1-inch from casing perforations at 9600-65 feet and open hole below 7-inch casing seat at 9675 to 9858 feet, where it is bottomed in granite. This fourth producer logged 741 feet of broken gas-distillate and oil pay in Ellenburger before reaching granite wash at 9850 feet without showing water. Amon G. Carter and Pure Oil Company's Walton 4-C, east offset to their discovery and 119 feet low on top of Ellenburger, is completing at 9835 feet with pipe at 9635 feet. Phillips Petroleum Company increased its scheduled operations to six, all flanking the discovery tract.

Sinclair Prairie Oil Company's Campbell 1, 3½ miles southeast of the Keystone field, was drilling at 11,100 feet, having logged 375 feet of Silurian before entering Montoya (Upper Ordovician) at 10,505 feet. In the North Monahans area, recent Clear Fork strike, Stanolind Oil & Gas Company's Sealy-Smith 2 and 3 were drilling at 3330 and 2820 feet, respectively, and a third project had spudded.

Andrews County: Stanolind Oil & Gas Company's Midland Farms Company 1-F, SE NW G&MMB&A 1, Block 42, T-2-N, 6½ miles northeast of the North Cowden field, nearest production, is rated as the third oil strike for the company this year in West Texas. Pipe was cemented at 4756 feet to make preliminary test and deepen after drill-stem test of saturated lime at 4825-88 feet yielded 150 feet of mud and 1680 feet of 27-gravity oil. This discovery entered Yates at 3140 feet and Grayburg at 4510 feet with elevation of 3084 feet. Nearest wells in the North Cowden field enter pay at 200 to 250 feet in the Grayburg section. The Texas Company's Jones 1, wildcat near the southeast edge of Shafter Lake and 1¾ miles north of the company's Pattillos 1, recent discovery in Grayburg and San Andres zones and awaiting pumping gauge, showed 4 feet of saturated lime in core at 4384-4403 feet. Another core was being pulled at 4422 feet.

Expansion of the Fullerton field one mile west materialized when Anderson-Prichard Oil Corporation's McCrea 1 tested 1 barrel oil hourly on swab after using 1000 gallons of acid in Clear Fork at 6829-6900 feet. More acid treatments will follow.

Gaines County: Continental Oil Company's Jones 1-A, 8½ miles southwest of the Wasson field, filled 11,000 feet with salt water from perforations at 12,120-12,219 feet in Ellenburger, topped at 11,845 feet. Seven-inch was cemented at 11,177 feet and 5-inch liner on bottom at 12,222 feet. Perforations will be made in upper Ordovician, Pennsylvanian and Basal Permian. Amon G. Carter's Wasson 5-C extended the deep producing area in the Wasson field a mile southwest and became first dual completion from the Clear Fork zones. This outpost flowed 469 barrels initial after using 8000 gallons of acid in broken pay at 6250-6876 feet, and produced 226 barrels of 35-gravity oil initial through 2-inch, with gas-oil ratio of 375/1, following use of 5000 gallons of acid in the lower pay at 7090-7426 feet. Carter's Moore 11, ½-mile east of his discovery for the 6350-foot zone, is idle at 7600 feet, having failed to qualify as a commercial producer from either zone. Other deep failures tend to restrict the Clear Fork to a small area in the Wasson field.

Pecos County: Phillips Petroleum Company's Ada Price 1, wildcat that established a new depth record in drilling to 15,270 feet and to its objective, the Ellenburger, topped at 15,075 feet, will be cased with 5½-inch pipe for production tests. No shows were reported in the Simpson, topped at 13,100 feet, or the Ellenburger, but a high-pressure gas zone at 11,561 feet offers possibilities for production. In the McDer area, Humble Oil & Refining Company's Wilson 1, north offset to the discovery gasser in Wolfcamp, was drilling 4860 feet after flowing oil, sulphur water and a small volume of gas through tester at 4720-43 feet. Shell Oil Company's Cordova-Union (Atlantic) 1, east offset to the dormant Ellenburger discovery for the Owego pool, was awaiting acid treatment after failing to indicate production from Ellenburger perforations at 4006-16 feet. Magnolia Petroleum Company et al's Lemar 1-A, south offset to the discovery, was drilling at 4192 feet, apparently still in Basal Permian.

Crane County: I. T. Dennis and James Fitz-Gerald Jr.'s McPherson 1, wildcat, resumed coring after testing dry at 5829 feet in Ellenburger, topped at 5788 feet, 351 feet low to failure situated 2⅞ miles south by west. The Texas Company's Hobbs-Shell 1, which indicated first Devonian production for the state at 5260 feet, was preparing to perforate opposite Silurian at 5670-85 feet to ascertain its value after plugging back from dry Simpson 5815-6020 feet to 5752 feet.

Carter Asking Revisions In Wasson Field Rules

A special hearing to consider revision of the Wasson field rules has been scheduled by the Texas Railroad Commission for May 10. Amon G. Carter requested the hearing to establish separate rules for three sands on the bases outlined below:

(1). Establish field rules for the Wasson "72" field, Gaines County, Texas.

(2). Amend the field rules for the Wasson (Deep) field by changing the name of the field to the Wasson "66" field, and by amending Rules 1, 2, and 18 of said rules as to well spacing, production units, et cetera.

(3). Amend the field rules for the Wasson field by changing the name of the field to Wasson "51" and by amending Rule 2 of the field rules applicable thereto to provide that wells drilled to horizons deeper than the 5100-foot pay and found to be non-productive therein may be plugged back to the 5100-foot pay and there completed, provided there is an undrilled 20-acre unit that can be assigned to such completion in the 5100-foot pay.

North Texas

New Pool or Extension in Montague County Section

Continental Oil Company and Sinclair Prairie Oil Company's Hundley 1, D. Martindale Survey, A-465, Mallard prospect, has uncovered an oil pool in the Fort Worth basin sector of Montague County, or it will prove to be a 2-mile extension for the Denver pool. Hundley 1 recovered a small amount of oil-cut mud when tester was used in Strawn sands at 4935-50 and 5709-21 feet. Conglomerate pay at 6231-61 feet was given a 30-minute drill-stem test, resulting in a gas flow within 3 minutes and oil flow within 5 minutes. The well continued to flow oil for 1½ hours after the tool was closed. The drill pipe contained 920 feet of oil and 160 feet of muddy salt water. This oil zone is from the base of Bend, or top of Marble Falls. The test was drilling at 6395 feet after testing salt water in conglomerate at 6311-25 feet, and is slated to continue to the Ellenburger, which is due near the 7600-foot level. Hundley 1 topped the Bend at 6005 feet, being 229 feet high to a 7176-foot Mississippian lime failure situated 1 mile to the northwest, and 63 feet high to Sinclair Praire Oil Company's Templeton 1, which is being completed as the second pumper for the Denver area from Bend perforations at 6040-59 feet.

Cooke County: Magnolia Petroleum Company's Long 1, north offset to the 5100-foot Strawn discovery for the Montgomery sector of the Walnut Bend area, resumed drilling after testing 180 feet of oil-cut mud when tester was used at 5835-5912 feet. A previous test at 5464-99 feet yielded 3050 feet of mud and salt water. Sinclair Prairie Oil Company's Cory 1, northwest offset to its discovery, recovered 185 feet of slightly oil-cut mud when tester was used on casing perforations at 6090-6120 feet with hole bottomed at 6223 feet. It is due to be plugged back to 5880 feet to perforate opposite several upper Strawn sands that indicated possible production.

Prospects: C. F. Peffley et al's Biggers 1, J. W. Blankenship Survey and 1¾ miles southeast of the Webb one-well Strawn pool, Jack County, tested 3,500,000 feet of gas daily after a 100-quart nitro shot at 2274-2310 feet, having plugged back from 3977 feet. In Hardeman County, Humble Oil & Refining Company's Dodson 1 was awaiting acid treatment under pressure after indicating first production for the county in pumping 28 barrels of oil and 18 barrels of water daily from perforations at 4248-55 feet. Second test is being drilled on the prospect by the company. In Cooke County, The Texas Company's Walterscheid 1-B, John Barnett Survey A-42, passed up nominal oil saturation in lime at 1821-30 feet, and was awaiting rig repairs at 1842 feet. Standard Oil Company of Texas and Hanlon-Buchanan's Wells 1, TE&L 738 and 2 miles east by south of the Holbert pool, added a Strawn pool for Young County in pumping 7 barrels of 40-gravity oil initial after a 15-quart nitro shot at 3571-79 feet, bottomed at 4851 feet. This wildcat recently was worked over after being temporarily abandoned last August due to subnormal production. A second test for the block has spudded.

Wildcat Failures: Shell Oil Company's Robertson 1, Archer County, tested water in Ellenburger dolomite at 5610-61 feet. In Clay County, Consolidated Oil Company's Gilbreth 1, flowed salt water after using 5000 gallons of acid in Ellenburger at 6295-6450 feet.

East Texas

Henderson County Wildcat Drilling Dry Travis Peak

Delta Drilling Company et al's Texas Pecan Nursery 1, eastern Henderson County wildcat largely financed by group of companies holding acreage in the immediate area, entered Travis Peak near the 10,503-foot level and this zone proved dry in drilling below 10,620 feet. Evidence of gas in tight Rodessa lime at 9685-9700 feet may warrant testing after the Travis Peak is explored.

Camp County: Mid-Continent Petroleum Corporation's McGahee 1, 4 miles northwest of Pittsburgh, was drilling shale at 8281 feet, having had water in the Pittsburgh field zone. Tide Water Associated - Seaboard Oil Company's Roberts 1 entered the Pittsburgh zone near the 8450-foot level and was drilling without shows at 8505 feet.

Wood County: Allied Oil Company et al's Chrietzberg 1, wildcat southeast of Quitman, was drilling at 3650 feet with Pecan Chalk tentatively called at 2950-3190 feet. Fisher Jackson & Fields' McCarley 1-B, offset to a low-gravity Woodbine oil discovery for the Oak Grove prospect, was drilling at 4060 feet.

Smith County: Sun Oil Company's Patterson 1 renewed its bid to become the first producer for the Rodessa zone in the Sand Flat area when it swabbed and headed 20 barrels of oil and 88 barrels of water on 15-hour test after using 500 gallons of acid through perforations at 9342-54 feet. The fluid level is 1500 feet from the surface. Successful completion of this well rests on exhaustion of the water which may have accumulated in the oil zone during the extensive testing period. Humble Oil & Refining Company's Shamburger 1, nearly a mile southeast of the nearest Paluxy producer in San Flat pool, was drilling at 7210 feet, apparently too low to make a Paluxy well.

Bammel Rule Postponed

The Texas Railroad Commission has issued an order postponing that portion of its order on the Bammel field, Harris County, requiring that the field be shut in during may.

At a recent hearing, the operators presented evidence to show that the pressure decline in the field has been arrested, and asked permission to continue production and test the wells at intervals of three days to determine whether there is any pressure change. The shutdown order had been entered as the commission felt it was necessary to close in and test all of the wells in the field to determine whether any of them were leaking after the Corzelius crater had been controlled.

☆

CHARLES E. YAGER, vice president in charge of explorations for the Texas Pacific Coal & Oil Company, Fort Worth, has been promoted to executive vice president.

Southwest Texas

Jackson Trend Featured By Promising Wildcats

In McMullen County, Atlantic Refining Company's Atkinson 1, Wilcox deep test, northeast corner of W½ 1280 acres, Martha Dean Survey 13, reported shows at 6851-61 feet, deepened and recovered 1900 feet of oil and 360 feet of brackish water, resumed deepening and went to 7183 feet, setting 7-inch casing at 7143 feet. An unconfirmed report indicated that another sand section was picked up at 6930-50 feet, drilled through and cores taken, and that an attempt will be made to test this zone through perforations. Edwin M. Jones' wildcat Ezzell C-2, 4 miles southeast of the Ezzell field, McMullen County, recovered 80 feet of 47-gravity distillate on drill-stem test at 6435-49 feet.

E. B. Lefebre's Arndt 1, wildcat 6½ miles south of Calliham on a 239-acre lease, Jerry Scanlon survey, had a slight show and was abandoned at 1066 feet.

Cameron County: Great Lakes Carbon Company's Yturria A-1, Santa Ysabel grant, 5 miles southwest of Port Isabel, made 6,000,000 feet of gas with a slight spray of distillate. Pipe was perforated in sand topped at 5980 feet; total depth 6142 feet where 9⅝-inch casing was run. Production is shut in under pressure of 1600 pounds.

DeWitt County: Arkansas Fuel Oil Company's Buehrig 1, 12 miles northeast of the Slick-Wilcox field, completed for 59 barrels of 54-gravity oil from perforations at 7627-35 feet. The company made location for E. J. Boldt 1, in the Otto von Roeder survey, 4 miles northwest of Buehrig 1 and 3 miles northeast of the Yorktown field.

Duval County: Argo Oil Company abandoned Canales 2, Share 38, Hinojosa Grant, wildcat 4860 feet west of Canales 1 dry hole, at 5310 feet. M. E. Davis abandoned Atlee Parr 1, San Andres grant, at 5713 feet. Taylor Refining Company's Thomas Lockhardt field, E. A. Parr D-3, survey 26, abandoned at 5690 feet.

Jim Hogg County: Standard Oil Company of Texas completed Canales 1, Share 26, Hinojosa grant, for 8 barrels per day through open tubing. Another test is planned in this area. The Texas Company's Yaeger 3, Survey 163 in wildcat territory 3½ miles northwest of the Yaeger field proved dry at 3331 feet.

☆

HOWARD E. HUNTER, district manager for Wilson Supply Company, in the Corpus Christi-Alice, Texas, district, died at his home in Alice, April 21.

CHAS. W. FOWLER, JR. recently promoted to position of vice president of Pantepec Oil Company of Venezuela. Following many years of experience in the oil industry, part of which was spent in Argentina, Fowler joined Pantepec Oil Company as engineer in 1941, and was later promoted to vice president of the company. He makes his headquarters at Maturin, in Venezuela.

Texas Gulf Coast

Ten Wildcats Staked As Wilcox Production Sought

No important new tests were concluded last week though intensive drilling activity continued and 10 wildcats were staked. The search for Wilcox production which began with the opening of the new Livingston field pay in Polk County went ahead though one failure was reported. The Texas Company abandoned Sealy and Smith Foundation 1, William Rankin survey, 2½ miles east of Dobbins in Montgomery County, at 9210 feet.

Humble Oil & Refining Company was reported preparing to test Granbury 1, Section 11, A. Viesca Grant, northeast of the Wilcox discovery at Livingston. The well was plugged back from 7500 feet in the Wilcox to test the Sparta section, and was reported to have cut a fault. Sinclair Prairie Oil Company's A. J. Thompson 1, Charles Fridshe survey in Colorado County, drilled to 10,300 feet and has set casing to test Wilcox sands. It was deepened from 8735 feet and had flowed some gas-condensate from perforations at 8177-82 feet. Stanolind Oil and Gas Company's Wilcox Falvey 1, 6 miles southeast of Shepherd in San Jacinto County, was drilling hard shale at 7300 feet. Gulf Oil Corporation's Kirby A-1, 2½ miles south of Call in Newton County, was drilling at 10,320 feet in shale deep in the Wilcox.

Galveston County: Pure Oil Company completed Shelor B-7 in the Dickinson pool for 22 barrels of 38.1-gravity oil on a 16/64-inch choke. Tubing pressure was 500 pounds. This well is a workover and was completed originally at 8036 feet before being plugged back to 8031 feet.

Stanolind Oil & Gas Company's Cade A-67, William Hudson survey, 660 south of No. 48 at High Island, deepened to 6139 feet, set liner to bottom, perforated at 5988-96 feet with 24 shots and completed for an initial gauge of 358 barrels daily of 35.6-gravity oil, no water, on a 9/64-inch choke.

Matagorda County: Possible new production for the section was looked for as Ohio Oil Company et al prepared to set 6-inch casing for production tests in Hefflefinger & Hermanson 1, wildcat in P. Burnett survey, 4 miles northeast of Blessing. Total depth was 9888 feet. A cave around 5500 feet was being cleaned out to bottom so pipe could be run when hole was accidentally sidetracked. Drilling is resumed in a new hole around 7000 feet.

On the west side of the North Bay City pool Sun Oil Company's Braman B-2 has set casing for completion with depth of hole at 8801 feet. Tests in perforations at 8400-02 feet showed increase in basic sediment. Latest gauge was taken on a 9/64-inch choke with production of 56 barrels, 16 percent basic sediment and mud.

Chambers County: Sun Oil Company was still testing Daugherty "Pool" 1, discovery well at North Winnie, showing good flow on various chokes. Potential test indicated 128.65 barrels of 37.6-gravity oil in 20 hours on ⅛-inch choke, tubing pressure 2290 pounds, casing pressure 1225 pounds, gas-oil ratio 2143/1. Production is made from perforations at 8757-69 feet.

Sun Oil Company was dual completing Betty Green 1, outpost of northwest Stowell field, from new perforations at 7710-32 feet. First perforations at 7600 feet flowed 17 barrels an hour on a ¼-inch choke. The company also staked a location for a southeast extension test to the Jackson Pasture pool, J. E. Jackson 1, S. Barrow survey, projected to 8425 feet.

Harris County: Application to deepen Nadeline Sellers 1 to 7500 feet has been made by Danciger Oil and Refining Company. The well is drilling at 5500 feet near contract depth of 6800 feet. Sellers 1 is a mile west of Spring.

Special Livingston Pool Rules Sought by Humble

Special rules for wells producing from the Wilcox sand in the Livington field, Polk County, were requested by Humble Oil & Refining Company at a Texas Railroad Commission hearing last week. The company asked to space wells 330 feet from lease lines and 933 feet apart on 40-acre units, which permit deepening of wells formerly drilled to the Cockfield without special exceptions to the spacing regulations. The new production is found between the gas-oil contact at 6755 feet and the oil-water contact at 6825 feet. The Cockfield is found at about 4000 feet, and between these two horizons the Sparta produces from 6000 feet to 6100 feet.

South Louisiana

St. Landry Parish Well Is Center of Attention

In the Cankton area of St. Landry Parish, where several unsuccessful tests were drilled in past years, Sun Oil Company completed E. M. Boagni B-1, Section 48-8s-4e, with a potential of 470 barrels of 38-gravity oil through a 9/64-inch choke, from perforations at 9667-90 feet in Frio sand. Hole was drilled to 10,512 feet in shale before being plugged and redrilled to 9270 feet. Estimates have been made of a 25-million-barrel reserve for this well.

The Texas Company's Swift 1, Section 14-5s-7e, wildcat about 2½ miles northeast of Krotz Springs, is reported testing. After reaching 10,874 feet, the hole was plugged and redrilled to 10,642.

Terrebonne Parish: Union Producing Company and Fohs Oil Company were trying to peg liner at Buckley-Bourge 2, 1-20s-16e, Delarge area, before trying for production below 13,500 feet and breaking the world record for deep production. Hole is at 13,588 feet, and 5½-inch has been set to 13,584 feet. Several squeeze jobs shut off salt water and perforations are planned for 13,530-40 feet.

St. Martin Parish: Amerada Petroleum Corporation's Emilie Kidder 1, 44-7s-5e, north of the discovery well and the second producer for the Arnaudville area, was running potential of 37 barrels of 46.5-gravity distillate daily, on 5/32-inch choke, tubing pressure 3450 pounds, gas-oil ratio 1836/1. Perforations were made in lower Frio at 9914-17 feet, a new sand for the field. The well is supplying gas for the company's Mrs. Joseph Kidder 1, 3050 feet east of Kidder 1, now drilling below 6004 feet in shale with streaks of sand.

Gulf Refining Company ran another production test at Iowa-St. Martin 1, Section 21-9s-7e, Section 28 Dome. After squeezing and reperforating the well made 200 barrels on a 5/32-inch choke. Details on testing were not available, but total depth was 11,300 feet.

Calcasieu Parish: Continental Oil Company's Prairie Land and Canal Company 1, 2-11s-9w, a deep wildcat test in the East Moss Lake area, had reached 10,400 feet, in Hackberry, set plug and was waiting on cement. A string of 5-inch liner was cemented to run tests in several sands indicating shows.

Assumption Parish: Three tests were nearing production levels: Humble Oil & Refining Company's Robichaux 1, 100-14s-15e, Labadieville area, ran log to 10,042 feet in sand and was preparing to go deeper; Phillips Petroleum Company-Sohio Oil Company's Amelia 1, Section 13-16s-13e, was drilling below 11,520 feet; Tide Water et al's Kressler & Sternfels 2, 136-12s-14e, Napoleonville Dome flank, was drilling shale at 8000 feet.

Four wildcat failures were reported in various sectors. Barnsdall Oil Company abandoned Fasilier 1, 31-7s-2w, in the West Tepetate area of Acadia Parish, after a fishing job at 9585 feet. Phillips Petroleum Company's Kreuse-Managan C-1, Section 28-6s-9w, Bear area of Beauregard Parish, was plugged at 6575 feet. In the Abbeville area of Vermillion Parish, Hassie Hunt abandoned Metty 2, 65-12s-3e, at 6437 feet. California Company had a dry hole in LeBlanc 1, Section 1-16s-23e, in the Barataria area of Jefferson Parish. Hole went to 11,107 feet.

North Louisiana

LaSalle Parish Deep Test Halted by Fishing Job

Two deep tests of the 12 active exploratory projects in North Louisiana have been halted by difficulties. The deepest well of the area, Placid Oil Company's Tremont Lumber Company F-1, Section 14-9n-2e, LaSalle Parish, was halted at 11,671 feet by a fishing job; and the Smackover lime test of the Cotton Valley Operators' Gray 1, 26-21n-10e, was delayed to squeezing off gas from the Cotton Valley zone at 10,332 feet.

The California Company abandoned at 3357 feet Jackson 1, SE NE 24-22n-10e, West Carroll Parish at 3357 feet, and J. M. Breedlove abandoned Adrian Land 1, C SW SW 2-11n-8w, Natchitoches Parish.

Sabine Parish: H. D. McDonald's Long-Bell 1, C SE SW 34-9n-13w, after squeezing at 4562-76 feet, prepared to reperforate for further testing.

Arkansas

Two Wildcat Failures Show in Union County

Two more wildcat failures were recorded in Union County last week, one seeking shallow production and the other drilled in search of the Smackover lime. Curtis Kinard abandoned Union Saw Mill Company 1, 4-17-12, near Pigeon Hill in the extreme eastern end of the county. The well was drilled to 4500 feet. Southern Oil & Gas Com-

pany's Trimble 1, C SE NW 13-16-17, was abandoned at 2700 feet.

Marine Oil Company has moved in heavier rig for a deep lime try at Bank 1, C SE SE 7-19s-13w, 3 miles south of Hillsboro, the first lime test in that immediate area.

One pumper was added to the Stephens-Smart field, Durbin Bond's Westley Section 7-15-19, being estimated good for 200 barrels per day from Travis Peak.

Florida

Humble Well Only One Drilling in Florida

Humble Oil & Refining Company's Gulf Coast Realties 2, in Collier County is the only current drilling operation in Florida. On April 27, hole had been made to 11,244 feet, with an indication that the Lower Cretaceous cavernous dolomite may be running perhaps 8 or 10 feet higher than in the first well, which was drilled to 11,626 feet. No oil shows have been encountered in No. 2, except for a non-commercial saturation in a tight zone around 9800 feet.

California

New Field Is Confirmed For Los Angeles County

Completion of Barnsdall Oil Company's wildcat in an area between East and West Coyote fields, Los Angeles County, confirmed the discovery of a new field for that locality. Brought in on the pump, initial production was 135 barrels of 24.5-gravity oil, but with a water cut of 20 percent that showed a tendency to increase. It is indicated another dome typical of the group productive in the Coyote district has been discovered, but the geology is not clear enough to justify immediate classification of the find as one of outstanding importance.

Wildcatting activity in the state continues strong, eight new starts having been announced this week. The great difficulty at the moment is to find rigs and men for these exploratory tests because of unprecedented demands for increased development drilling. New locations are being filed at the fastest pace ever experienced, the list for this week comprising 61 new wells and 19 deepening or redrill jobs. Total of new well locations this year, 678, compares with 420 for the corresponding period of 1943.

Fresno County: Exhaustive tests of several showings in Eocene sand bodies and one in the Kreyenhagen having yielded negative results. Standard Oil Company's 10,868-foot wildcat between Kettleman North Dome and East Coalinga is being abandoned. Showings, however, probably will be regarded as justifying a second try in a different location.

Kern County: At a point nearly a mile east of the Chanac production opened last year by Richfield Oil Company's Tejon discovery, M. Metzenbaum's wildcat found equivalent sand between 2585 and 2579 feet, and has set casing to make a production test.

The new Cymric pay extension discovery in Section 23-29-21 has been confirmed by official details released by Superior Oil Company. Production is 95

Two RX1V Le Roi Engines in operation near Cushing, Oklahoma — supplying dependable power "around the clock"
LE ROI
LE ROI
LE ROI Engines
stay with you
on the heavy drilling loads

Digging some 20,000 vertical miles into the hard rock of the U. S. is a wartime challenge to the petroleum industry. For results that confirm their good judgment in selecting machinery, men who are responsible for drilling operations rely on Le Roi Engines for continuous power to drive rotary machines and slush pumps, and for intermittent power to handle heavy pipe strings.

Le Roi engines give you the advanced design, heavy-duty construction, precision manufacture, and special features that assure you of low-cost, long-life, trouble-free operation. You get flashing, flexible power plus fuel economy. Complete range of sizes up to 400 H. P. Use natural gas, gasoline, or butane. Write today for descriptive bulletins.

P-30

Le Roi Company

1756 South 68th Street • Milwaukee 14, Wisconsin

Branch: TULSA, OKLAHOMA

• DISTRIBUTORS •

General Machine & Supply Co. Wichita Falls, Odessa, Texas

Southern Engine & Pump Co. Houston, Dallas, Kilgore, Texas

Western Machinery Co. St. Louis, Mo., Centralia, Illinois

Le Roi Rix Machinery Co. Los Angeles, California

LE ROI

barrels of 13.6-gravity clean oil from 31 feet of sand bottomed at 1452 feet. The find has reawakened interest in both exploratory and development opportunities of the field and adjacent areas. The company is going ahead with a step-out, and at another location about a mile to the west is drilling a deep test. Universal Consolidated Oil Company is arranging to drill all available locations on its offsetting 160-acre tract, and several other wells on other adjoining properties are in the planning stage.

Los Angeles County: After having established the discovery of a new pool in Aliso Canyon area, Roosa 1 has been killed, and will be drilled to Sesnon. Production from the higher zone, low-gravity oil of meager volume with a high water content, was not satisfactory.

An active campaign of working over old wells is spreading through the Torrance field, due to the success of several operators in isolating for production a small but rich sand that had been blanked off in original completions. The salvaged pay streak yields about 30 barrels a day, giving a very profitable return on the small recompletion costs involved.

Ventura County: In addition to speculation as to showings reported to have been found, Standard Oil Company's deep test in the Fillmore area is attracting attention because of breaking footage records. When it passed the 14,000-foot level this week, it became the deepest well ever drilled in Los Angeles Basin and the seventh deepest well ever drilled in California.

100 Million Barrels of Oil-Coming Up!

Today, when our country needs it most, millions of additional barrels of oil are "coming up". . pumped from the unseen reservoirs of petroleum—more than two miles underground. The petroleum industry is accomplishing a magnificent job . . . meeting the ever mounting requirements of our fighting nation.

More than 100 million barrels of oil are pumped annually by PACIFIC-WESTERN oil well pumping units. Pumped by dependable equipment installed by pioneer operators many years ago . . . and by present day operating companies owning more than a thousand pumping wells.

In the most severe operating conditions and on wells pumping from the greatest depths, PACIFIC-WESTERN pumping units are doing their war job.

You are invited to write PACIFIC-WESTERN for practical help on gearing problems. We have a corps of engineers who are skilled in oilfield operations. Their experience as leading producers of geared petroleum machinery is available.

Ask for your "Peak Torque Estimator."

PACIFIC GEAR PLANT
WESTERN GEAR WORKS
Commercial Offices—1111 Long Beach Blvd., Lynwood, Calif.
PLANTS: SEATTLE, LYNWOOD, VERNON, SAN FRANCISCO

Rocky Mountain Area

Elk Basin Field Is Extended by Carter Well

Stanolind Oil & Gas Company's Johnson-Parkinson 1, SE NE SW 20-18n-77w, Cooper Cove wildcat in Carbon County, Wyoming, found the Sundance water-bearing on drill-stem test at 5283-5304 feet, and after drilling to 5373 feet is plugging back to complete in Dakota sand. Top of the Sundance was logged at 5210 feet. The Dakota sand at 4834 feet yielded 3500 feet of oil, 120 feet of mud-cut oil on drill-stem test open 75 minutes in Dakota sand at 4868-93 feet.

Gebo Test: Continental Oil Company's Unit 2, SW SW NE 23-44n-95w, Gebo Dome field, Hot Springs County, drilled to 4970 feet, 161 feet into Tensleep sand, plugged back to 4900 feet, and has perforated the Embar, top at 4534 feet, as follows, preparatory to acidizing and testing the Embar section: 4534-84 feet, 250 shots; 4592-4612 feet, 100 shots; 4625-50 feet, 125 shots. Unit 2 is ¼ mile north of Unit 1, discovery well of the field which produced 1080 barrels of oil initially from the upper Embar at 4735-4842 feet, flowing through ¾-inch choke. In the discovery well Tensleep at 5171-5211 feet was water-bearing, and in Unit 2 oil saturation was reported at 4845 feet but results of testing the Tensleep sand have not been released.

Elk Basin: Carter Oil Company's Johnson 2, NE NE NW 8-57n-99w, Elk Basin outpost in Park County, was completed in Tensleep at 5640-5805 feet for an initial of 567 barrels of oil daily. It is a mile south of the nearest producer.

Michigan

Development Continues in Missaukee County Field

Limited increase in developmental work is expected for the East Norwich field, Missaukee County, opened in 1942. Sun Oil Company has developed nine wells to date, completed Horner 7, S½ SW NW 12-24n-5w, in Richfield lime-dolomite at 4565 feet for 152 barrels in 8 hours after successive acid treatments totaling about 9000 gallons. Horner 8, north offset, produced 155 barrels in 23 hours after 2000- and 6000-gallon treatments at 4628 feet. Previous completions in the same formation had produced under 100 barrels per day initially. The field had an accumulative production history of 28,219 barrels to January 1 this year and produced 4763 barrels in February this year.

Newaygo County: Pure Oil Company's Peterson 1, E½ SE NW 16-11n-11w, first test on a core-drilled block, logged Traverse lime at 2597 feet and carried a light oil show and water at 2610-15 feet with no increase to 2658 feet. Hole will be carried deeper to test Dundee and Monroe.

Imogene Field Rules

Humble Oil & Refining Company has asked that the rules for the Imogene field, Atascosa County, Texas, be amended to allow the drilling of wells 330 feet from lease lines. However, only one well would be drilled on 40 acres.

U. S. Exploratory Completions

ALABAMA WILDCAT

Choctaw County—Failure: Hunt Oil Co.'s J. T. Doggett 2, c se nw 2-10n-4w, abnd 3918 ft.

ARKANSAS WILDCATS

Ashley County—Failure: Union Prod. Co.'s Crossett Lbr. Co. D-2, 753 s 757 e of nwc 3-18s-9w, abnd 5500 ft.

Union County—Failures: C. E. Murdock Tr.'s Felsenthal 1, c sw sw sw 28-16-17, abnd 3500 ft.

Southern O&G Co.'s J. D. Trimble et al 1, c se nw 13-16-17, abnd 2904 ft.

B. W. Murphy-J. E. Head's Union Sawmill 1, c ne nw 4-17-12, abnd 4350 ft.

CALIFORNIA WILDCATS

Kern County—Failures: Iseminger Bros.' 2, sw nw ne 2-28-28, Round Mountain area, Vedder 1935 ft, abnd 1950 ft.

Harry H. Magee's Amalgamated Hoppold 1, c sw 15-25-24, cored 2755-99 ft, below first Mya, abnd 3051 ft.

Union Oil Co.'s Kernco 88-8, se se se 8-29-25, Rio Bravo area, Stevens zone not present, abnd 10,844 ft.

Wilshire Oil Co.'s Cardoza 1, ne nw ne 7-30-29, Edison area, gray sand, abnd 4694 ft.

Cresmont Oil Co.'s Staley 17, nw ne se 8-28-29, Round Mountain area, Vedder missing, abnd 1501 ft.

Los Angeles County—Failure: Selbar Oil Co.'s Watson 1, 1560 ft s 1735 ft e c/l 223rd St and Avalon Blvd, 17-4-13, Dominguez area, abnd 5630 ft.

Santa Barbara County—Failure: Union Oil Co.'s C. H. McNee 1, se se sw 20-9-32, East Cat Canyon area, abnd 3663 ft.

ILLINOIS WILDCATS

Clay County—Failures: Texas Co's Kemmer 1, nw ne se 34-4n-6e, abnd 3080 ft.

Talbot et al's Smith et al 1, sw sw ne 16-3n-6e, abnd 3130 ft.

Franklin County—Failure: Magnolia's Hall Unit 1, nw ne nw 14-5s-3e, abnd 3222 ft.

Jefferson County—Failure: Heath et al's Hurst 1, se se nw 19-1s-3e, abnd 2628 ft.

INDIANA WILDCATS

Crawford County—Failure: Carter's Korsmeier 1, sw sw sw 2-6s-12w, abnd 2741 ft.

Knox County—Discovery: Muller's McDowell 1, se se se 36-2n-11w, McCl 1857 ft, pump 22 bbls, td 1867 ft.

Warrick County — Failure: Highland Oil's Grimwood 1, sw nw se 26-4s-9w, abnd 1917 ft.

NORTH LOUISIANA WILDCAT

Concordia Parish—Failure: Royal Petroleum Corp.'s Canebrake 1, 1-8n-10e, dry and abnd 9659 ft.

SOUTH LOUISIANA WILDCATS

Iberville Parish—Failure: Humble's Federal 1, start swc sec 1 go nly on wl 1980 th ely at ra to lcn in 1-11s-13e, flow sw 11,285-90 ft, abnd 11,738 ft.

Vermillion Parish — Failure: Texas Co.'s State Lse 340 D-1, n 19° 30 mins w 20,215 fr USCGS Station "Muddy" in Vermillion Bay T-15s-4e, abnd 11,649 ft.

SOUTH LOUISIANA OUTPOST

Livingstone Parish — Hope Villa Failure: Sugarfield Oil Co.'s Evans 1, start m/sly cor sec 49 go 1980 s 58° 30 mins w th 660 n 31° 45 mins w to lcn 49-8s-3e, shly sand, kicked, abnd 9871 ft.

MICHIGAN WILDCATS

Allegan County — Failure: Southwest Dev. Co.'s Gorton 1, nw se nw 13-2n-12w, Traverse 1664 ft, abnd 1708 ft.

Huron County—Failure: Sinclair Wyoming Oil Co.'s Rink 1, ne sw nw 24-17n-14e, Dundee 1998 ft, abnd 3378 ft.

Lenawee County—Failure: W. H. Eckert's Taylor 1, se ne sw 32-8s-5e, St. Peter 2928 ft, abnd 3900 ft.

Van Buren County—Failure: Oil Producers' Hartman 1, se se sw 2-3s-16w, Traverse lime 1066 ft, abnd 1075 ft.

MICHIGAN NEW PAY TEST

Clare County — Cranberry Lake Failure: Leonard and Rowmors' Miltner 1, s½ sw se 1-20n-6w, otd 3840 ft, so&w 5114-16, so&w 5182-87, abnd 5205 ft.

MISSISSIPPI WILDCATS

Adams County—Failure: J. P. Evans et al's R. L. Parker, Jr. 1, begin cor secs 37, 38, 40-8n-2w, go n 67° e 1109 th n 16° w 2442 th n 73° 30 mins e 649 to lcn 17-6n-2w, Tuscaloosa 10,035 ft, abnd 11,115 ft.

Jefferson County—Failure: Gulf's Ella Cato et al 1, 1217 s 712 e of nwc ne 30-8n-4e, chalk 6220 ft, abnd 10,920 ft.

MONTANA WILDCATS

Pondera County—Midway Discovery: R. C. Tarrant's Wiley-Edwards 1, nw ne nw 2-27n-1w, Sunburst 1655 ft, so 1667-91 ft, wtr 1681-97 ft, flow 100,000 gas, 570-575 ft, td 1715 ft, pb 606 ft.

Pondera County — Failure: Hageman & Pond's Rispen 2-X, sw ne nw 20-28n-1w, Sunburst 1743-68 ft, so 1757-61 ft, 800 ft wtr 1761-68 ft, abnd 1769 ft.

NEW MEXICO WILDCATS

De Baca County—Failure: M. Staniforth et al's State 1, ne se ne 27-4n-22e, elev 4846 ft, Glorietta 1200 ft, Yeso 1580 ft, abnd 1785 ft.

Lea County—Failure: Carper Dr. Co.'s Nellis 1-a, 660 ft snl 1930 ft wel 5-18s-33e, elev 3715 ft, base salt 2905 ft, red sand 4265 ft, abnd 4305 ft.

KANSAS WILDCATS

Barber County—Failures: Alpine Oil's Curry 1, 5-31s-12w, Topeka 3392 ft, Lans 3903 ft, Doug 3744 ft, Viola 4592 ft, Simp 4681 ft, Arb 4804 ft, abnd 4834 ft.

Champlin Ref. Co.'s Gentry Estate 1, nec sw 13-33s-15w, Miss 4771 ft, Viola 5079 ft, Simp 5225 ft, Arb 5327 ft, abnd 5370 ft.

Barber County—Discovery: Huber's Skinner 1, cw nw nw 17-31s-14w, base KC 4162 ft, Simp 4494 ft, Arb 4609 ft, perf 40 shots 4356-74 ft, 1000 gals acid, 34,567,000 gas, 1467 lbs rp, td 4626 ft.

Barton County—Failure: Shell's Stueder 1, nwc se 36-17s-12w, Topeka 2698 ft, Lans 3045 ft, Arb 3354 ft, abnd 3382 ft.

Brown County—Failure: Ohio's Peck 1, 15-1s-16e, Lans 985 ft, Miss 2377 ft, Hunton 2780 ft, abnd 2880 ft.

Cowley County—Failure: Wakefield's Lipperd 1, nw sw sw 32-31s-3e, Miss 3070 ft, abnd 3395 ft.

Dickinson County — Failures: Wolf Creek's Walker 1, nw nw se 1-13s-1e, Lans 608 ft, Miss 1714 ft, Hunton 2698 ft, Viola 2961 ft, Simp 2984 ft, abnd 3072 ft.

Bay Pet.'s Reiff 1, se sw nw 8-16s-1e, Lans

Under many circumstances Man must work in the Wet, yet guard himself from it. Whether the conditions are natural or part of an industrial process, Frog Brand Protective Work Clothing by Sawyer offers the correct solution to any such problem.

THE H. M. SAWYER & SON CO.
East Cambridge, Mass.

PETROLEUM PRODUCTION ENGINEERING

By LESTER C. UREN
Professor of Petroleum Engineering
University of California

VOL. I—Oil Field Development. New Second Edition, thoroughly revised and enlarged. Chapter Headings: Properties, Occurrence and Associations of Petroleum; Petroleum Exploration Methods; Acquisition of Title to Oil Lands; Developing the Field; Drilling Equipment and Methods; Churn Drilling Equipment and Methods; Rotary Drilling Equipment and Methods; Casing, Casing Appliances and Casing Methods; Fishing Tools and Methods; Oilfield Hydrology; Exclusion of Water from Wells; Finishing the Well; Well Records.

531 pages, 6x9, 258 illustrations. Price.....$5.00

VOL. II—Oilfield Exploitation. Here are up-to-the-minute data on how to drain petroleum from its reservoir rocks, how to bring it to the surface and prepare it for shipment, how to care for and remove impurities from the crude petroleum, how to design, construct and operate pipe lines. The book is based on the author's contacts with all the important oil-producing regions of the United States.

741 pages, illustrated. Price.....$6.00

Send orders to

The Gulf Publishing Company
P. O. Box 2608 **HOUSTON, TEXAS**

2016 ft, Doug 1859 ft, Miss 2659 ft, abnd 2706 ft.

Phil-Han's Utech Estate 1, nw nw 3-16s-4e, Miss 2247 ft, abnd 2300 ft.

Ellis County — Failures: Appleman's Von Lintil 1, nwc 4-14s-16w, Topeka 2920 ft, Lans 3185 ft, Arb 3460 ft, abnd 3486 ft.

Bradley et al's Engel 1, swc nw 3-14s-19w, Topeka 3220 ft, Lans 3505 ft, Arb 3874 ft, abnd 3905 ft.

Ellsworth County — Failure: Benson Drlg. Co.'s Morevak 1, sw sw nw 22-15s-10w, Viola 3285 ft, Simp 3315 ft, Arb 3375 ft, abnd 3380 ft.

Greenwood County—Failure: Whittaker et al's Snider 1, cw sw se 9-26s-10e, B'ville 1820 ft, Miss 2056 ft, abnd 2085 ft.

Harvey County—Discovery: Rock Sand & Gravel's Woods 1, nwc se 10-23s-3w, perf 36 shots 3268-78 ft, 5000 gals acid, 2,000,000 gas, td 3376 ft.

Harvey County — Failure: Carlook et al's Schragg 1, c nw nw 25-22s-3w, Miss 3148 ft, Misener 3557 ft, Hunton 3560 ft, Simp 3707 ft, Arb 3792 ft, abnd 3804 ft.

Marion County—Failure: Sohio's Voth 1, swc sw 9-21s-1e, Miss 2927 ft, Viola 3413 ft, Simp 3453 ft, Arb 3525 ft, abnd 3550 ft.

Nemaha County—Failure: Ohio's Lamparter 1, c ne sw 3-2s-14e, Decorah 3753 ft, St. P. 3858 ft, Cambrian 3817 ft, abnd 3947 ft.

Pratt County—Failure: Ohio's Lemon 1, se ne se 25-27s-15w, Lans 3997 ft, Viola 4544 ft, Arb 4738 ft, abnd 4820 ft.

Reno County—Failure: Helmerich & Payne et al's Sheele 1, c nw sw 12-25s-5w, Miss 3505 ft, Viola 3945 ft, Simp 3963 ft, Arb 4049 ft, abnd 4100 ft.

Rush County—Failure: Phillips' Tinker 1, se se ne 13-18s-17w, Lans 3253 ft, Cong 3554 ft, Reagan 3578 ft, Granite Wash 3578 ft, abnd 3589 ft.

Russell County—Failures: Texas Co.'s Beisel 1, ne ne se 6-14s-11w, Cong 3268 ft, Arb 3290 ft, abnd 3306 ft.

Huber's Truan 1, sw sw ne 17-15s-15w, Topeka 2786 ft, KC 3063 ft, abnd 3388 ft.

Saline County—Failure: Margay's Millikan 1, nw sw se 31-14s-2w, Miss 2642 ft, Hunton 3045 ft, Viola 3230 ft, abnd 3310 ft.

Stafford County — Discoveries: Stanolind's Syms 1, c s nw ne 20-21s-12w, Arb 3580 ft, 5000 gals acid 3587-91 ft, pump 192 bbls, td 3594 ft.

Atlantic's McCandless 1, swc se 30-25s-13w, Lans 3705 ft, perf 58 shots 4251-67 ft, flow & pump 734 bbls, td 4323 ft.

Stafford County — Failure: Bridgeport's Cooper A-1, swc 29-24s-11w, Lans 3468 ft, Miss 3781 ft, Misener 3865 ft, Viola 3897 ft, Simp 4011 ft, Arb 4078 ft, abnd 4102 ft.

OKLAHOMA WILDCATS

Okfuskee County—Failure: Summitt Drlg.'s Gafford 1, se se nw 12-11n-7e, Oswego 3552 ft, Crom 3708 ft, abnd 3725 ft.

Oklahoma County—Failure: Hall's McKee 1, nw sw 23-14n-4w, 1st Wx 6835 ft, 2nd Wx 6918 ft, abnd 6935 ft.

Seminole County — Failure: Mealy - Wolf's Baker 1, sw se ne 35-9n-7e, Booch 3325 ft, Crom 3525 ft, abnd 3585 ft.

Stephens County—Failure: Sohio's Franklin 1, c ne sw 20-1n-8w, abnd 5003 ft.

WEST TEXAS WILDCATS

Concho County—Failure: E. M. Thomasson et al's Keys 1, 330 ft nsl 925 ft wel ACH&B sur No. 1, elev 2011 ft, Ellenburger 2820 ft, abnd 2922 ft.

Crockett County—Failure: John I. & P. D. Moore's Todd-Amerada 1-14, c sw se E. L. & R. R. Co. 14, blk YZ, elev 2537 ft, salt 1380-1600 ft, lime 1892 ft, 7500-ft test, but structurally low, abnd 2502 ft.

Gaines County—Failures: Case, Pomeroy & Co.'s Fee 1, c sw ne PSL 13, blk C-44, elev 3225 ft, anhydrite 2283 ft, 5500-ft test, but structurally low, abnd 2320 ft.

Sid Richardson's R. A. Cox 1, c ne sw W. T. Ry. 148, blk G, elev 3359 ft, abnd 5800 ft.

Hockley County—Failure: T. P. Coal & Oil Co.'s Grissom Bros. 1-A, 660 ft out nwc labor 10, Lge 24, McCulloch CSL, elev 3474 ft, anhydrite 2250 ft, brown lime 3870 ft, San Andres 4330 ft, abnd 5283 ft.

Yoakum County—Failure: Honolulu's Williams 1, c ne nw sec 78, blk D, J. H. Gibson sur, elev 3682 ft, anhydrite 2370 ft, brown lime 4030 ft, San Andres 4420 ft, abnd 5215 ft.

WEST CENTRAL TEXAS WILDCATS

Jones County—Failure: Hickok D&P Co.-Harry Reynolds-Joe Gallagher's Manley 2-A, 1120 ft nsl 820 ft ewl T&P 35, blk 14, elev 1645 ft, abnd 1662 ft.

Taylor County—Failure: W. H. Rogers, Jr., tr.'s Cade 1, 330 ft out se cor 220-ac lse and T&P 12, blk 16, elev 1778 ft, abnd 2655 ft.

SOUTHWEST TEXAS WILDCAT

Webb County—Failure: O. W. Killam's Garcia Est. 22, 330 fr nl 650 fr el 40-ac unit of swc blk 37, sur 592, Los Ojuelos Gr, abnd 2206 ft.

SOUTHWEST TEXAS OUTPOSTS

Duval County—Sejita Extension: Trinity Gas Corp.'s Eudoxio Guerra 1, 500 fr wl 250 fr nl 200-ac lse, San Pedro de Charco Dedondo Gr, 2000 sse Navarro's Morgan 1 on sw flank, elev 338, pay 5754 ft, perf 5754-75 ft, flow 11 bbls 44.8-gr, 3/32-in, 10,000/1, td 5840 ft.

Starr County—Garcia Extension: Sun's Z. Solis B-1, 467 fr s&wl 63.62-ac lse, tr 31, porc 95, Juris of Camarago Gr, 2 mi nnw ext well, pay 3777 ft, flow 85 bbls 43-gr oil, 20% wtr, 7/64-in, td 3781 ft.

LOWER TEXAS COAST WILDCATS

Jim Wells County—Failure: L. M. Josey, Rupert Cox, Dan Clark's R. B. Jackson 1, c lots 67-68 sec 21, Jose Pacheco Gr, abnd 6383 ft.

Victoria County—Failure: Rowan & Hope's Rosena Wagner 1, 1787 fr swl 2173 fr nwl Indianola RR Co. sur 51, A-225, abnd 4505 ft.

LOWER GULF COAST OUTPOST

Dewitt County—Nordheim Failure: Tide Water's Minna Schueneman 1, 772 fr swl 1740 fr nwl 123-ac lse, Stephen Prather sur, abnd 8439 ft.

TEXAS GULF COAST WILDCATS

Harris County—Failure: Shell's Wm. Holderrith 1, 600 fr s&wl 40-ac unit 550 n 1800 w of swc, W. White sur, abnd 12,453 ft.

Montgomery County—Failure: Atlantic Refining Co.'s South Texas Dev. Co. 1, s&w 40-ac unit nw cor lot 66, C. Beach sur, abnd 10,708 ft.

Tyler County—Failure: Jack Frazier-John Mayo et al's Houston Land & Tr. Co. 1, 660 fr n&wl 80-ac tr, John Sims sur, abnd 9012 ft.

Wharton County—Failure: W. Stewart Boyle et al's Claude Appling 1, 595 fr e 728 fr nl e 40-ac tr of 138.29-ac unit IRR sur 7, A-260, James sur A-457, temp abnd 6007 ft.

EAST TEXAS WILDCATS

Cherokee County — Failure: Continental's Southern Pine Lumber Co. 1, 330 ft out nec 2270-ac lse, T. N. Jones sur, 12 mi sw Rusk, elev 388 ft, Pecan 4241 ft, Austin 5103-5292 ft, Woodbine 5302 ft, sand 5366 ft, abnd 5515 ft.

Franklin County—Failure: Humble's Hague 1, 660 ft out nec 97.58-ac lse, Joseph P. Riddle sur, 1 mi sw Winfield, elev 343 ft, Georgetown 4455 ft, Paluxy 5221 ft, massive anhydrite 6582-6718 ft, Travis Peak 7303 ft, Cotton Valley 8730 ft, Smackover 11,239 ft, abnd 11,510 ft.

Robertson County—Failure: Wm. L. Clary and J. S. Fabriguze's Sandifer 1, 3000 ft fr sw 5000 ft fr nwl, M. Grande sur, abnd 1250 ft.

The OIL WEEKLY'S TRADING POST

USED EQUIPMENT FORUM

CLASSIFIED ADS . . . EQUIPMENT . . . SERVICES . . . PERSONNEL

FOR SALE

■ **12x12 OWS Heavy Duty Engine Skids Crane Trap Lubricator, Cutoff, Controls, etc. 8" Substructure with 24" Sub Base with Draw-works Extension. Boyken 7" Draw-works complete, Emsco Catheads, Engine and Draw-works made two wells. Steam End only for 20" Gardner pump new, complete. Tongs, Elevators, etc. 1 Butler Slip Type 7" to 10¾. B J LINKS and several American Overshots, complete. Victor C. Smith, El Dorado, Arkansas.**

■ **Ideco draw works (Unitized), Ideal & Oil Well twin cylinder drilling engines, 18" Wilson-Snyder & 14" Ideal pumps, Drilling cables, Engine substructure, Moon generator, Brewster core reel & line, Brewster drill collar, core barrels, etc., 7" Hughes gate valve 3000 lbs., 7x3x8 Worthington pump, American overshot 8¼" OD, Wilson drill tongs & Elevators, Mission & WKM slips. Other equipment, First class, Priced right. Sorrento Petroleum Corp., American Bank Building, New Orleans, La.**

ADVERTISING RATES

TRADING POST SECTION

Regular classified advertisements for this special section, set in type this size without border, take flat rate of 7 cents per word for the first insertion and 5 cents per word for each subsequent insertion of same copy. Display advertisements for this section, set in suitably larger type with ruled border, are $5.00 per inch for first insertion and $4.00 per inch for subsequent insertions. Remittance must accompany copy which should be sent to:

Trading Post Section, THE OIL WEEKLY
P. O. Box 2608 Houston 1, Texas

WANTED TO BUY

■ **2000 to 3000 feet of 2-inch upset seamless tubing in 20 or 30 foot lengths with tool joints not larger than 3-inch O.D., suitable for use as drill pipe on Failing core drill. Merry Bros. & Perini, Box 840, Abilene, Texas.**

HELP WANTED

WANTED: Safety Engineer National Synthetic Rubber Program, with oil refinery experience and some engineering background, to head up fire and safety group in Butadiene Plant, Los Angeles area. Excellent working conditions and climate. Salary commensurate with qualifications. Write directly to Shell Chemical Division of Shell Oil Corporation, Box 211, Torrance, California.

LAWYER

Major oil company wants young man or young woman with good legal training for work in Land Department. Please state qualifications and experience in first letter. Address L. M. Lamar, 1818 Canal Bldg., New Orleans 12, Louisiana.

■ **WANTED: A Petroleum Engineer with field experience, for engineering development work, with a large manufacturer of oil field equipment and materials. Permanent position with good future for right man. In replying state age, education, business background, salary desired, etc. Address: Box 35, c/o The Oil Weekly, Houston, Texas.**

■ Sperry-Sun Well Surveying Company has openings for:

Two District Representatives
One Directional Drilling Engineer

Applicants must have not less than three years' experience in well surveying or directional drilling and field work. Deferred draft status and certificate of availability for permanent employment are essential. Mail applications, in duplicate, care of

Sperry-Sun Well Surveying Company
3118 Blodgett Avenue
Houston 4, Texas

Major oil company has openings available for graduate petroleum engineers having at least 3 years acceptable experience general oil field development. Salary open. All hiring will be done in accordance with War Manpower Commission Stabilization Plans. Reply to Box No. 33, c/o The Oil Weekly, Houston, Texas.

SITUATIONS WANTED

■ **Landman and Geologist desires connection with reliable company or individual. Recently discharged from Army. Twelve years experience, including South America. Address Box 62, Gravette, Arkansas.**

NORTH TEXAS WILDCATS

Archer County—Failure: Fortex Oil Corp.-H. B. Dudley's Ferguson 1, 300 ft sni 880 ft ewl blk 9, R. McKim and KWVFL sur, abnd 1855 ft.

Clay County—Failure: Continental-W. B. Omohundro's Courtney 1, 330 ft out nwc e½ sec 11, E. Hall sur A-193, elev 835 ft, Bend 5964 ft, detrital 6310 ft, Ellenburger 6500 ft, abnd 6601 ft.

Cooke County—Failure: F. C. Blagg et al's Rosson 1, 234 ft nsl 1648 ft wel BBB&C Ry. sec 19, A-146, elev 1005 ft, abnd 1104 ft.

Young County—Failures: Kerlyn Oil Co.-Phillips' King-Inez 1, 330 ft out nwc sec 1920, TE&L Co. sur, Bend 4126 ft, Barnett 5065 ft, Mississippi 5121 ft, Ellenburger 5268 ft, abnd 5395 ft.

Hedrick Oil Co.'s Winkler 1, 200 ft n&e of nec TE&L Co. sec 406, but in I. Holman sur A-130, abnd 1313 ft.

NORTH TEXAS OUTPOST

Young County—Sewell Extension: Thos. D. Humphrey et al's M. K. Graham 1, 1738 ft fr m/n/n 660 ft fr m/e/wl, G. W. Robinson sur, A-1820, ¾-mile se of oil production same zone, elev 1287 ft, flow 920 bbls 41.6-gr, 1-in, 1643/1 gas, 1000 gals acid Bend perf 3995-4003 ft, td 4160 ft.

WYOMING OUTPOST

Park County—Elk Basin Extension: Carter Oil Co.'s Johnson 2, ne ne nw 8-57n-99w, 1 mi s of closest prod, 7-in 5620 ft, flow 567 bbls Tensleep 5640-5805 ft, td 5805 ft.

Tangipahoa Parish: Humble's Williams 1, start nec se sec 31 go 661 wly alg nl se th sly 662 parallel to el 31-7s-8e, lcn 9500-ft test.

NORTH LOUISIANA

Caddo Parish: R. F. Kayser's Cerdes 1, se se se 5-14n-16w, lcn 2900-ft test.

O. R. Pennington's Williams 1, c sw sw 3-15n-15w, dr.

O. R. Pennington's Greenberg 1, c nw nw 9-15n-15e, lcn.

MICHIGAN

Lake County: Manistee Development Co.'s Stephens 1, nw ne ne 18-19n-14w, rig.

Mecosta County: C. L. Maguire's Oliver 1, s½ se ne 11-14n-7w, dr.

C. W. Collins' Bowman 1, ne sw sw 29-14n-7w, dr.

Midland County: Chapman Oil Co.'s Crosby 1, s½ ne se 15-16n-1w, dr.

Ottawa County: C. A. Perry's Boerema 1, ne se ne 35-7n-15w, dr.

MISSISSIPPI

Claiborne County: Freeport Sulphur Co.'s W. R. Hammett 5, 2100 s 750 e of e cor sec 15 in 13-11n-1e, sulphur test, rur.

Simpson County: Gulf's A. J. Roberts 1, 715 fr nl 670 fr wl se nw 23-2n-5e, lcn.

Washington County: Grubb & Hawkins' C. Manganos 1, c sw se 36-17n-7w, lcn.

OKLAHOMA

Cotton County: Carter's Reynolds 1, c sw ne 8-2s-11w, lcn.

Kay County: West Virginia Oil & Gas Co.'s Johnson 1, ne ne 19-27n-1w, 3482 ft, woc.

Lincoln County: Wilcox Oil & Gas Co.'s Sparks 1, se ne sw 21-13n-5e, lcn.

McClain County: Carter's Lamar Ranch 1, c ne sw 28-8n-3w, lcn.

Oklahoma County: Phillips' Johnson 1, se ne 9-14n-4w, lcn.

Pottawatomie County: K. G. F. F. Oil's La Reau 1, c sw sw 33-6n-3e, lcn.

Seminole County: McIntyre et al's Sawyer 1, se nw sw 12-6n-6e, lcn.

OKLAHOMA

Custer County: Fox & Fox's Dickerson 1, c ne ne 18-12n-19w, rur.

Garvin County: Cooper's Potter 1, sw se 8-4n-3e, dk.

Kay County: West Virginia O&G Co.'s John-

United States Wildcat Starts

ARKANSAS

Union County: Marine Oil Co.'s Bank 1, c se se 7-19s-13w, lime test, dr.

CALIFORNIA

Kern County: Bandini Petroleum Co.'s Bacon 1-21, se se sw 21-28-20, South Belridge area, dr 560 ft.

Richfield's Old River KCL 1, ne ne sw 3-31-26, Ten Section area, lcn.

Standard's Von Glahn 1, c se 34-23-22, Alpaugh area, lcn.

Standard's 4-8, sw nw sw 27-29-29, Kern Bluff area, fdn.

Los Angeles County: Standard's Bell Comm. 1, 564 ft swly alg c/l Avalon fr c/l Olive th 630 ft wly at r/a, Rosecrans area, lcn.

Orange County: R. S. Lytle, Operator's Greene Wing 1, nw nw nw 15-5-11, Westminster area, lcn.

Solano County: Standard's Suisun Comm. 3, sw nw nw 5-3-1, Suisun Bay area, rig.

Ventura County: Shell's Rogers A, sw nw se 22-5-18, Devils Canyon area, lcn.

ILLINOIS

Franklin County: Ring's Clayton 1, se se ne 2-5s-3e, lcn.

Jasper County: Big Chief Drlg.'s Ross 1, nw nw 35-7n-9e, drlg 2005 ft.

Montgomery County: Cassens' Marburger 1, nw se se 31-8n-5w, lcn.

Perry County: Magnolia's Reuscher-Fromling 1, nw se sw 11-7s-4w, lcn.

Shelby County: Lynch's Amling 1, ne ne nw 20-12n-2e, lcn.

INDIANA

Posey County: Nat'l Assoc. Pet.'s Elliott 1, sw 23-5s-14w, lcn.

KANSAS

Cowley County: Grallup et al's Hankins 1, se nw nw 22-34s-5e, lcn.

Ellsworth County: Bridgeport's Shamabe 1, ne se 29-15s-9w, lcn.

Ford County: Texas Co.'s Andrews 1, nw nw sw 17-29s-23w, brr.

Marion County: Ingling Drlg.'s Funk 1, sw sw sw 23-19s-2e, lcn.

McPherson County: Phil Han et al's Keifer 1, nw nw se 11-19s-1w, lcn.

Norton County: Texas Co.'s Fitch 1, se se se 2-7s-21w, brr.

Rawlins County: Stanolind's Mullen 1, sw se 14-4s-35w, lcn.

Rooks County: Barnsdall's Schlin 1, sw nw 9-9s-18w, lcn.

Sedgwick County: Beech Aircraft's Parrish 1, se nw ne 29-28s-23w, lcn.

KANSAS

Barber County: Ohio et al's Shriver 1, sw nw 5-30s-14w, rur.

Great Lakes Carbon's Hastings 1, nwc ne 1-31s-15w, dr 2432 ft.

Champlin Rfg. Co.'s Skinner 1, se se ne 11-32s-15w, dr 470 ft.

Barton County: Cohen's Converse 1, nwc sw 17-19s-15w, lcn.

Bridgeport's Batchman A-1, sec nw 35-20s-12w, dr 620 ft.

Texas Co.'s Pritchard 1, ne ne se 34-20s-14w, dr 520 ft.

Butler County: Vickers Entz 1, ne ne sw 28-24s-3e, dr 640 ft.

Morris et al's Wright 1, sw se se 25-28s-7e, dr 1245 ft.

Cowley County: El Dorado Rfg. Co.'s Sparks 1, sw se se 35-33s-4e, lcn.

Ellsworth County: Phillips' Zvolanek 1, se se nw 29-14s-9w, c.

Cities Service Vacek 1, ne ne sw 32-15s-10w, dr 3035 ft.

Skelly's Brown 1, 1-17s-9w, lcn.

Greenwood County: McGinnis' Leedy 1, swc nw 31-25s-12e, rum.

Marion County: Wolf Creek's Unran 1, se ne sw 33-19s-1e, woc.

Texas Co.'s Weinbrenner 1, nw nw ne 34-19s-1e, dr 2845 ft.

McPherson County: Plains Exploration et al's Baldwin 1, ne sw se 26-18s-2w, dr 2335 ft.

Morris County: Deiter et al's Porter 1, ne ne sw 24-16s-9e, lcn.

Ness County: Skelly's Norton 1, nwc 23-17s-26w, lcn.

Norton County: Phillips' Turk 1, se ne ne 31-5s-21w, rur.

Pratt County: Lion's Andrews 1, sec 24-29s-14w, woo 4517 ft.

Shell's Wendel 1, se ne ne 31-29s-11w, dr 3994 ft.

Reno County: Texas Co.'s Hinshaw 1, nw nw ne 29-23s-9w, dr 2322 ft.

Falcon Seaboard et al's Miller 1, swc 26-25s-10w, dr 2615 ft.

Rooks County: Polhamus' Sakis 1, c n ne se 9-10s-19w, lcn.

Russell County: Porter Co.'s Eulert 1, nwc ne 26-11s-15w, dk.

Scott County: Atlantic's McDaniels 1, ne ne sw 34-19s-33w, dr 2885 ft.

Sedgwick County: Beech Aircraft's Shinn 1, sw sw ne 15-28s-2e, lcn.

Shawnee County: Alexander et al's Millkan 1, nw se 10-12s-17e, lcn.

Stafford County: Barnsdall's McGill 1, nwc ne 16-23s-12w, dr 2266 ft.

Falcon Seaboard et al's Koelsch 1, nw sw sw 11-24s-14w, dr 3919 ft.

SOUTH LOUISIANA

Cameron Parish: Amerada's Glassell et al 1, 9474 n 7850 e of Umbrella Point Marker 16-12s-10w, n of W. Hackberry, lcn.

"Mother Knows Best"

Kids like logic. Only when you give a youngster a reason he can understand is he likely to co-operate. "Mother knows best" may get obedience, but it won't get deference. Grown folks are like kids, only more so. This "mother knows best" stuff we get from the administration and the bureaucrats these days is not easily tolerated. It rankles. But the oil industry will carry on, because oil IS ammunition. And men who TRY PELCO FIRST for supplies and equipment will get old-fashioned pre-new-deal co-operation.

WE'VE SUPPLIED OIL MEN IN OUR AREA FOR 36 YEARS

PELICAN WELL TOOL & SUPPLY CO.

SHREVEPORT LOUISIANA

PELCO

Houston
Berwick
Houma
New Iberia
Lake Charles

son 1, ne ne 19-27n-1w, Oswego 3284 ft, Miss 3378 ft, td 3482 ft, woc.

Lincoln County: Wilcox O&G Co.'s Sparks 1, se ne sw 21-13n-5e, br.

Noble County: Morgan's Devore 1, nw nw sw 17-24n-1e, woo.

Oklahoma County: Phillips' Coder 1, se ne 9-14n-4w, c&p.

Seminole County: McIntyre et al's Sawyer 1, se nw sw 12-6n-6e, dr 1515 ft.

Newton Barrett Drlg.'s Baker 1, ne nw se 29-10n-6e, Oswego 2887 ft, Calvin 2890 ft, dr 3250 ft.

Stephens County: Texas Co.'s Cooper 1, sw sw sw 16-2n-8w, dr 5401 ft.

Tillman County: Miller et al's Webb 1, nw nw ne 34-1n-18w, woo 3000 ft.

SOUTHWEST TEXAS

Duval County: Humble's Clements Garcia 1, 3300 e of el 4620 n of sl 1940-ac lse, Las Blanco Gr, lcn 7000-ft test.

H. J. Porter's W. W. McCampbell 1, 1350 fr nw 450 fr swl sur 12, 640-ac lse, lcn 4500-ft test.

McMullen County: Plymouth Oil Co.'s W. H. Sling et al 1, 990 fr e 330 fr sl, Beatty, Seale & Forwood sur 111, lcn 4000-ft test.

J. C. Thomas' C. F. Dingle 1, 760 fr nw 1108 fr sel 807-ac lse, Roderick O'Boyle sur, lcn 1100-ft test.

Webb County: Sun's Isaac Hirsch et al 1, 467 s of nl 2638-ac lse 467 e of wl, J. Poitevent sur 247, lcn 7000-ft test.

HOUSTON LABORATORIES

Analytical and Consulting Chemist

Podbielniak Gas Analysis

Oil Field Brines, Waters and Cores

Complete Evaluation of Crude Oils

Long Distance 267, Box 132, Houston, Tex.

LOWER TEXAS COAST

Bee County: W. Earl Rowe et al's R. W. Welder 1, go 356 n alg line Thos. Quirk sur A-57 th w 1350 at ra to lcn, lcn 5200-ft test.

Dewitt County: Arkansas Fuel Oil Co.'s Emil Boldt et al 1, 753 fr el 826 fr nl 174-ac lse, Otto Von Roeder sur A-471, elev 290, lcn 9000-ft test.

Jackson County: Butcher-Arthur's A. Lorenzen 1, 1200 se of nwl 725 sw Lavaca River, J. J. Linn sur A-213, spud.

Kenedy County: Humble's Chas. Armstrong 1, 14,395 s of nl 49,396-ac lse 5990 e of ctr line Missouri-Pacific RR, La Barreta Gr, lcn 8500-ft test.

Refugio County: Hewit & Dougherty's Jamie Hynes A-1, 393 fr ne 467 fr el 640-ac lse, elev 47 ft, lcn 7000-ft test.

WEST TEXAS

Andrews County: Phillips' University 1-H, 660 ft ewl 664 ft nsl sec 39, blk 9, lcn 6500-ft test.

Dawson County: Stanolind's C. T. Locke 1, c ne ne E. L. & R. R. Co. 96, blk M, lcn 6000-ft test.

Gaines County: Amerada's T. E. Jones 1, c sw sw PSL 59, blk AX, lcn 7500-ft Clear Fork test.

Case, Pomeroy & Co.'s Kuehn 1, c nw ne PSL 11, blk C-44, mim for 5500-ft test.

Pecos County: Culbertson & Irwin's O. L. Barnes-Humble 1, c e¼ of e¼ H&GN 134, blk 10, lcn 5000-ft Ellenburger test.

Ward County: Gulf's John Edwards 1, 660 ft wel 2043 ft nsl PSL 1, blk B-19, mim 10,500-ft Ellenburger test.

WEST CENTRAL TEXAS

Callahan County: B. C. Mann et al's Mann 1, 1353 ft snl 660 ft wel of 177-ac tr, Wyatt Hickman sur, mim for 1800-ft test.

Stephens County: T. P. Coal & Oil Co.'s Wright 1, 990 ft nsl 330 ft wel TE&L Co. sec 1165, lcn 4300-ft Mississippi test.

EAST TEXAS

Rusk County: H. C. Owens et al's Smith-Patrick 1, 1050 ft fr m/n/s 600 ft fr m/e/el, Daniel Woodland sur, on 101-ac tract, 3½ mi sw Pine Hill, rog.

NORTH TEXAS

Archer County: D. H. Bolin et al's Abercrombie 1, 2678 ft nsl 1548 ft wel blk 152, Harris subdiv, lcn 1400-ft test.

D. H. Bolin et al's D. M. Harris 1, 1203 ft snl 300 ft ewl blk 76, Harris subdiv, lcn 1400-ft test.

D. H. Bolin et al's G. A. Key 1, 5290 ft snl 1253 ft ewl, A. J. Richardson sur A-356, lcn 1400-ft test.

D. H. Bolin et al's R. H. King, tr-"J. T. Richardson" 1, 6600 ft nsl 1320 ft ewl, J. Scott sur A-374, lcn 1400-ft test.

D. H. Bolin et al's Roy H. King, tr 1, 300 ft out nec sec 7, BBB&C Ry. A-48, lcn 1400-ft test.

Cochran & Cain's S. B. Herron 1, 150 ft nsl 670 ft ewl sec 16, blk 5, Clark-Plumb sur, lcn 1200-ft test.

Deep Oil Development Co.'s L. F. Wilson 1-E, 150 ft out nec lot 1, sec 122, ATNCL sur, dr 1270 ft, 1500-ft test.

Deep Oil Development Co.'s L. F. Wilson Est. 1-94, 1320 ft snl 1170 ft ewl lot 2, sec 94, ATNCL sur, lcn 1700-ft test.

R. E. Hansen et al's McAnnally 1-A, 200 ft out nec sw¼ sec 13, Meade LM-Pasture subdiv, lcn 1500-ft test.

Clay County: Edge Oil Co.-Continental's W. D. Crockett 1, 330 ft out nec of 100-ac lse, w½ TE&L Co. sec 3245, lcn 6500-ft Ellenburger test.

Cooke County: Texas Co.'s W. C. Briscoe 1, 990 ft wel 815 ft snl 110-ac lse and J. M. Bailey sur A-115, mim.

Jack County: Continental's A. E. Sewell 1, 330 ft snl 4218 ft wel, Wm. Montry sur A-404, lcn 6200-ft Ellenburger test.

Wilbarger County: J. N. Fidel et al's Shelly 1, 510 ft out swc H&TC 46, blk 13, lcn 5000-ft test.

Physical analysis of Natural Gas

at the well

ASSOCIATED ENGINEERS — GAS LABORATORY — 1912 WEST GRAY — HOUSTON, TEXAS

PRECISION

INSPECTION SERVICE

NON-DESTRUCTIVE INSPECTION

- MAGNAFLUX
- X-RAY
- RADIUM

PORTABLE FIELD EQUIPMENT

6006 NAVIGATION BLVD.,
W. 6-6922 P. O. 1901 HOUSTON, TEXAS

Standco

NO-SMOKE

STANDCO BRAKE LINING

for the easiest brake known. It "feeds off" evenly. Standco never scores brake rims. See page 2808 Composite Catalog.

Standco Brake Lining Co.
HOUSTON

Squeaks from the Bull Wheel

Flattery—In Reverse

Why did you get me such big shirts? These are four sizes too large for me.

They cost just the same as your size, and besides, I wasn't going to let that strange clerk know I'd married such a little shrimp as you.

Fifty-Fifty

The guests were discussing the colonel's evident immunity from mosquito bites, and the negro house servant was called upon for an explanation.

"Well, suhs, I reckon it's just dis way. In de fo' part ob de night he mos' gen'ly is so 'toxicated he don't pay no 'tention to de skeeters, an' in de las' part ob de night de skeeters is so 'toxicated dat they don't pay no 'tention to him."

Explanation

"I've got an awful lot of electricity in my hair."

"I don't doubt it. You always have such shocking things on your mind."

Perfect Memory

"You never remember our wedding anniversary."

"I do, distinctly. According to your present age, it occurred when you were three years old."

Outlived Them

Nonagenarian: "I am dying without an enemy in the world."

Consoling parson: "That is splendid, John, to have gone through life without making an enemy."

Nonagenarian: "No! No! Not that, parson. The So-and-So's are all dead."

Lucky Day

"Been fishing, eh? Caught anything, old man?"

"Caught the 9:10 there and the 5:47 back. Caught in a storm. And boy, will I catch it when I get home!"

Disconcerting

"See that boy over there annoying Mary?"

"Why, he isn't even looking at her."

"That's what's annoying her."

Biggest on Top

"What's the idea of parading all the big men in front of the little men?"

"It's the sergeant's fault. He used to run a fruit store."

Heredity

"What you a-doin', chile?"

"Nuthin', mammy."

"My, but you's a gettin' more like youah daddy ev'ry day."

Reward For Caution

"I've never said quick things that I regretted later."

"Well, what does that make you?"

"A bachelor."

Finding Out

The lady of the house suspected that one of her two sons had been dating the maid. Anxious to find out which one, she said:

"Nora, if you had the opportunity of going to the movies with one of my sons, which one would you choose?"

"Oh, it's hard to say, ma'am. I've had grand times with both of them. But for a real rollicking spree, give me the master."

Not the Gas

Customer: "What makes this car jerk so when you put it in gear?"

Salesman: "Eagerness to get away, sir, nothing more I assure you."

Accepted

"What did the Sergeant say when you told him you'd be a sister to him?"

"Why the rascal had the nerve to ask me to lend him a dollar so he could take another girl to a movie."

Amon Carter's Letter of Criticism and Publisher's Reply

AMON G. CARTER, oil operator and president and publisher of The Fort Worth Star-Telegram has submitted a letter of criticism which is presented herewith together with a reply by Ray L. Dudley, publisher of THE OIL WEEKLY:

Dear Mr. Dudley:

While not a subscriber to THE OIL WEEKLY, an article appeared in your April 3 issue referring to the recent gas ratio hearing on the Wasson Pool in Gaines County, has been brought to my attention.

I feel this article which appeared, on what I understand is commonly believed to be your editorial page, was wholly unfair to the members of the Texas Railroad Commission. As a matter of fact, it was a reflection on their integrity. The following, as a matter of record, is a verbatim statement of your editorial:

"State Proceedings That Do Not Help"

"Those who attended the recent Wasson field gas-oil ratio hearing before the Texas Railroad Commission in Austin witnessed a scene that did nothing to encourage furthering the current agitation for dissolution of PAW and the return of oil regulatory rule to state agencies. For an open meeting at which a matter of interest to a number of parties was to be discussed, it was a peculiar session.

"Witnesses saw what looked like too much partisanship on the part of commission members. Although approximately 90 percent of the wells in the field are complying with the state gas-oil ratio law, and owners of some of the other wells expressed willingness to correct their violations, one commissioner prompted a witness of the lone concern opposing an order that would require all wells to reduce their gas-oil ratio to the state maximum. During the meeting, another commissioner announced he had made up his mind, which was to oppose any change. Many obtained the impression that the commission was playing politics, perhaps because the protestor owns a prominent newspaper and is politically influential.

"Another peculiar angle to the hearing was that all three of the commissioners were present and stayed through its duration, an unusual procedure, except for a statewide hearing."

You state that "many obtained the impression that the commission was playing politics, perhaps because the protestor owns a prominent newspaper and is politically influential." You further referred to "another peculiar angle to the hearing" to the fact that three commissioners were present and stayed through its duration and mentioning this as an unusual procedure except for a statewide hearing. This accusation is not only false but unfair to the commissioners as they have set in, time after time, at field hearings in East Texas. In fact, they have gone to even some of the smaller towns for field hearings. To cite one instance: members of the commission went to the little city of Hawkins in East Texas to hold a field hearing on a pool which had only a few wells at that time. I understand that one of the companies supposedly requesting a reduction in the Wasson gas-oil ratio owns approximately 90 percent of the Hawkins field. As I recall you made no complaint or criticism at the time regarding the commissioners being present for the hearing.

The Wasson, being one of the largest pools in the state, it should not be considered unusual for all commissioners to be present at a hearing concerning it.

Publisher's Statement

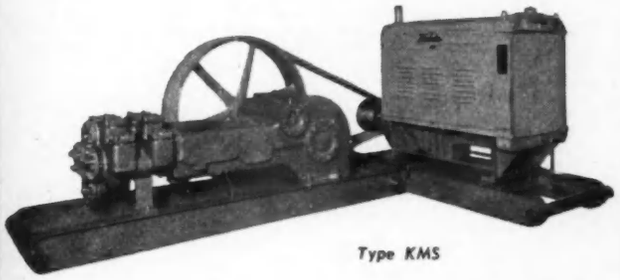
Your statement regarding the protestor owning a prominent newspaper and being politically influential, is just a cheap, dirty, little dig without a semblance of justification. You must have been thinking about yourself and talking about me. Incidentally, the publication with which the protestor has had the privilege of being associated for almost 40 years, stands on its own bottom and fights for the constructive development of Texas, which includes the constructive development and protection of the state's largest industry—the oil business—irrespective of whether it affects the large major companies or the independents. It does not straddle the fence or lean in one direction: namely, the majors, as some publications I have in mind and that I am thinking of right now. I do not recall your publication ever having taken exception to anything the majors might do, even in the much discussed case of the rubber cartel. Further, the publication which I represent publishes annually, regularly, a Post Office statement giving the full ownership of the publication, its list of stock holders, bond holders and bonded indebtedness, if any, etc. It is not a bad law and it should apply to all publications. The public should be entitled to know who really owns or sponsors any publication entitled to the use of the United States Mails.

Your February 7, 1944 issue carried a story on its "Changing Panorama" page, regarded by the oil industry as your editorial page, stating "the feeling is growing that the need for widespread regulation of oil is passed, and that it would be beneficial if PAW were at least materially reduced in scope, if not dissolved."

When Colonel Thompson wrote a letter commending the move, your publication, THE OIL WEEKLY, in only one week's time, your February 14th issue, reversed yourself completely and claimed the first story was not an editorial and wrote: "We sincerely hope that no effort will be endorsed by the oil industry to dissolve Petroleum Administration for War at this time, as was indicated by THE OIL WEEKLY (page 9, February 7)."

As thinks the rest of the industry, Colonel

LOCKETT-WORTHINGTON
POWER-DRIVEN PUMP UNIT



Type KMS

LET a "Lockett Dealer" supply your pump-equipment needs! Worthington Pumps and *genuine* Worthington Repair Parts are available — through Lockett Dealers — from warehouses maintained in the principal oil fields throughout Texas and Louisiana, backed up by a large replenishing stock at our Houston and New Orleans Warehouses. Worthington Pumps are adaptable for use with gas, gasoline, Diesel, or electric motor of any specified type or manufacture.

Just as you are assured of getting reliable performance and years of efficient and uninterrupted service from a Worthington Pump, you are also assured of getting prompt, dependable service through Lockett Dealers.

A. M. LOCKETT & COMPANY, LTD.
NEW ORLEANS HOUSTON DALLAS

SOUTHERN
PUMPING
UNITS

Unit No. V-140

Le Roi Power Unit — Viking Pump. Capacity 140 barrels per hour.

Complete units and replacements in Houston and Kilgore stocks.

SOUTHERN

Southern Engine & Pump Company
HOUSTON DALLAS SAN ANTONIO KILGORE

THE FORT WORTH LABORATORIES

Analysis of oil field brines, cores, gas, oil and minerals. Field gas testing. R. H. Fash, Vice President; Long Distance 138 823½ Monroe Street, Fort Worth, Texas

William M. Barret, Inc.

Consulting Geophysicists

Specializing in Magnetic Surveys

Contracts accepted for domestic and foreign projects, using the most improved instrumental and interpretative technique

GIDDENS-LANE BUILDING
SHREVEPORT, LOUISIANA

An A.A.P.G. Book (1942)

Still meeting a strong demand

SOURCE BEDS OF PETROLEUM

By PARKER D. TRASK and H. WHITMAN PATNODE

REPORT OF INVESTIGATION SUPPORTED JOINTLY BY THE AMERICAN PETROLEUM INSTITUTE AND THE GEOLOGICAL SURVEY OF THE UNITED STATES DEPARTMENT OF THE INTERIOR FROM 1931 TO 1941.

RESULTS OF A.P.I. RESEARCH COMMITTEE NO. 4. WORK DONE UNDER ADVISORY COMMITTEE COMPOSED OF R. F. BAKER, B. B. COX, F. R. CLARK, K. C. HEALD, W. B. HEROY, L. P. GARRETT, F. H. LAHEE, A. W. McCOY, H. D. MISER, R. D. REED, AND L. C. SNIDER.

"The main object of this study of lithified deposits has been to determine diagnostic criteria for recognizing source beds."

600 pages, with bibliographies and index.
72 figures, 152 tables. 6 x 9 inches.
$4.50, POSTPAID

THE AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS

BOX 979, TULSA 1, OKLAHOMA, U.S.A.

Thompson no doubt thought the first article was an editorial as he wrote you: "It was with unusual interest that I read your splendid editorial entitled, 'PAW Dissolution May Be Sought'."

An extremely important phase of the hearing that THE OIL WEEKLY overlooked was the sound technical evidence submitted by the witnesses for the protestant. The hearing room was filled with major company legal and engineering "experts" who usually attend all hearings where they are particularly interested or concerned and it was remarkable that they did not attack the chief witness, to whom you refer, by cross examination or contradictory evidence. There were several unsworn statements made, some of which favored the gas-oil ratio limit, some for a lower limit and at best one which would leave the matter to the discretion of the commission. At a Goldsmith field hearing some weeks past, some of those with low operating gas-oil ratios at Wasson and high operating gas-oil ratios at Goldsmith, or with properties that are not in the gas-cap area of these fields, seemed to have entirely different ideas as to a "proper" gas-oil ratio limit. Such inconsistencies are not novel by any means, but I wonder that you should criticize when apparently you do not have all the facts before you. Could it be than an "international authority on oil and gas engineering" should let the allegedly political aspects of a hearing warp your judgment? Could it be that some of these inconsistent operators exerted political influence on you? If you are susceptible to such influence, may I suggest a firm resolve to stand by the available technical facts will assist in a consistent course.

Discovered Wasson Pool

Incidentally, the protestor in this case discovered the Wasson original pool when major oil companies had an opportunity to drill it. It's been a long, troublesome battle. We have had pipe-line proration, reduced prices and whatnot, none of which were necessary as was demonstrated when the compact shut down oil production in the Mid-Continent for a 15-day period as the result of the majors' unwarranted attempt to cut the price.

What happened at the hearing? I am not sure whether you had a staff man representing you or not at the time in Austin, but in any event you surely can recall what happened. At San Jacinto, the Mexicans under Santa Anna, opposing the Texans, got down on their knees and cried, "Me no Alamo! Me no Goliad!" Some of the major oil companies at the hearing in Austin at the time of the shut down proclaimed, so-to-speak, "Me no oil." One large company that had been the instigator in reducing the price claimed to have less than 12 million barrels of oil on hand. So the picture changed promptly. As a small independent operator, I had stored in tanks, wash tubs, water buckets and all available utensils possible on the Wasson a mere 16,000 barrels of oil which, even a few days before the shut down, the major refused to run, while immediately following the shut down they ran the oil in 24 hours.

The more I think about this matter, Mr. Dudley, the more I am convinced that you should look into the oil business and check up on some of the racketeering that has been invoked against the independent operators in Texas. It would be far more beneficial to the independent operators, and royalty owners than the sarcastic innuendoes that you carried about the Railroad Commission in the Wasson hearing in your issue of April 3rd.

In conclusion, I have no desire to be unfair, or to insinuate or question your integrity, although I do question the facts necessary to substantiate your offside crack about the commission and the protestor at the oil hearing on March 22, 1944. I am not sure whether you carry a column of letters from the people in your publication or not, but I do feel that, in justice to the commission, you should publish this reply in full, as is the custom in vogue on the publication represented by the protestor. There is a difference in dishing it out and taking it, and I await your decision with interest. If you dodge the issue, I will be compelled to transmit the above information probably in that case to more people than are reached by your publication. If you do publish it, I am sure you will be fair enough to publish it in full.

A. G. CARTER

CC:Hon. Beauford Jester, Chairman,
Hon. Olin Culberson, and
Colonel Ernest Thompson,
Railroad Commission,
Austin, Texas.

Publisher's Reply

Mr. Dudley's reply follows:

MY DEAR MR. CARTER:

Your letter of April 17 has been received, and as I have already indicated to you, would have been published last week had it not been for paper limitations. We apologize for printing it in small type—but we still have a paper problem.

I find from reading your letter that it was divided into two parts—not necessarily in sequence, but in thought.

One part of your letter was to the effect that there was nothing to cause comment in the Texas Railroad Commission hearing referred to in a previous issue of THE OIL WEEKLY . . . that no precedent was set by the commission when all commissioners were present at a field hearing, and that you, as protestor offered good technical testimony to sustain your position. I note that you did not mention in your letter (other than to quote the article of which you complained) anything about a commissioner prompting your witness, or the action of one commissioner in saying that he had made up his mind before opposing testimony was introduced.

The burden of this portion of your letter was to the effect that there were no political implications involved. THE OIL WEEKLY had commented on the *appearance* of things but it is perfectly willing to give you space to assert that there were no political implications involved and that as a matter of fact nothing unusual occurred at the hearing. We cannot apologize for the way we saw things at the meeting, hope we do not have occasion to see things in that light at future commission meetings, and if you insist that your newspaper and political influence were not involved, we will take your word, but if you should print this letter we hope that you, too, will print it in full and not stop immediately before the preceding comma.

The second part of your letter was an attack on THE OIL WEEKLY, its publisher and its editorial policy and in replying to that we certainly will not take your word for anything you said.

Not a Subscriber

To begin with, Mr. Carter, it was not necessary for you to preface your letter with the observation that you were not a subscriber to THE OIL WEEKLY. You need not have apologized for that because undoubtedly there are many people who read copies of THE OIL WEEKLY paid for by somebody else. I am mentioning your apology for not being a subscriber (or am I in error in understanding it as an apology?) because elsewhere in your letter you take to yourself such a complete knowledge of THE OIL WEEKLY's past editorial policy as to make me wonder who really prepared the data for your letter. As a matter of fact, I really do not wonder very much!

THE OIL WEEKLY did have a representative covering the hearing, and it has talked with oil men who attended it also. We understand that technical testimony had been prepared for witnesses who did not testify after Commissioner Culberson announced his decision before all the testimony was in. Commissioner Culberson may have been within his rights in saying what he did, but I find it very hard to feel that it *looked* right. A Texas Railroad Commissioner and the wife of Caesar really have much in common in what they should avoid.

Your impression that the postal law requiring publication of ownership does not apply to business publications is, of course understandable. If you were a reader of business publications you long ago would have observed that they are under the same postal regulations as apply to newspapers. If there is any difference between the way the law is observed it may be that in our instance we publish the information on ownership and bonded indebtedness in all of the editions of the issue carrying it. To amplify the statement we publish, in accordance with postal regulations, let me enlighten you further and tell you that 67.4 percent of our voting stock, and all of our non-voting stock, is owned by the publisher, his immediate family and employes; that men connected with major companies own 2.1 percent of the stock; that persons connected with independent oil companies or independent operators own 6.6 percent and that the remainder is owned by people not now connected with oil companies, much of it being owned by families

JUSTRITE *means real safety!*

When inspecting rigs, pipelines, loading points or other places where safety is a *must*, use the Justrite All-Purpose Safety Lantern. It gives plenty of light . . . and at the same time, assures *complete* safety from hazards often created by unapproved lighting methods.

Each Justrite Twin-Bulb, All-Purpose Safety Lantern is approved not only by Underwriters' Laboratories, Inc., but also by the U. S. Bureau of Mines for safe use in Methane Gas and Air Mixtures.

These approvals are your assurance that when you switch to Justrite, you get . . . SAFETY.

Write today for complete details.

JUSTRITE MANUFACTURING COMPANY
2063 N. Southport Avenue, Dept. G-3, Chicago 14, Ill.

of former employes. We have no bonded indebtedness, owe no notes, discount our bills and are making no attempt to borrow any money from anyone.

See Best in All

Your inference that THE OIL WEEKLY is biased against independents and in favor of major oil companies is about as absurd as one could expect from a man who obviously gains his impression from what someone else says, rather than from regular reading of the publication. THE OIL WEEKLY, as a matter of fact, gets along pretty well with major and independent alike.

You see, we have stuck to our publishing knitting and have not traded on information gathered by our staff to go into the oil business, as we no doubt could have, and since our eggs are all in the OIL publishing basket, we are naturally inclined to see the best in all elements of the oil industry, although sometimes we do report a happening or express an opinion which is not 100 percent popular with all our subscribers, not to mention some who do not subscribe.

I recall occasions when friends in some major companies have expressed the opinion that THE OIL WEEKLY was unfairly balanced in favor of the independent. Occasionally some independent may have felt as you expressed yourself. But we in our modest way have tried to take the position we thought was right and fair.

And now I come to that portion of your letter in which you suggest that THE OIL WEEKLY did an "about face" on PAW, and am I correct in thinking that maybe you suggested that an "about face" was executed because Colonel Thompson of the Texas Railroad Commission congratulated us on what he mistakenly thought was an editorial? May I suggest that you borrow another copy of THE OIL WEEKLY and read both the story in the February 7 issue (not an editorial) and the editorial which followed in the February 14 issue. You as a newspaper man would see immediately that it was not an editorial but a report on a movement underway.

As a matter of fact THE OIL WEEKLY has not reversed its position as you would very well know if you made any attempt to find out. THE OIL WEEKLY favors the return of spacing control, except in the case of exceptions, to the regulatory bodies of such states as have them, and it does so with a prayer in its heart that the state regulatory bodies will not allow their actions to be dictated by political considerations.

An interesting little sidelight on THE OIL WEEKLY'S position is that in some quarters, in Washington, so I hear, the report has been going around that THE OIL WEEKLY and the Texas Railroad Commission are in some sort of an unholy alliance in an attempt to destroy PAW during war times!

You make reference to a statewide hearing before the Texas Railroad Commission in Austin after the "shutdown." Yes, Mr. Carter, we had a staff man there—two of them in fact and in addition the publisher was there also, although he does not remember seeing you. Possibly you were there but after all that is not important. If you will check up on files of THE OIL WEEKLY you will see a rather comprehensive report on what happened at the hearing and if you have patience and will look back an issue or two before it, you will find that THE OIL WEEKLY said some fairly plain things about the situation at that time.

You suggest that we look into the oil business and check up on some of the racketeering that has been invoked against the independent operators of Texas. I am not sure, from the context, if you are suggesting that the major companies or PAW (my interpretation leans to the former) are doing this racketeering. If you have any evidence along this line I am sure that you would find a responsive audience among some of your Washington friends. I have not seen any racketeering that I recall though I have seen policies which, while perfectly legal, were not in accordance with my own beliefs and we have commented on them in THE OIL WEEKLY. In fact it is just such comment of which you complain. After all, you own a newspaper and the field is wide open.

As the discoverer of an important oil pool, we congratulate you.

In your troubles we commiserate with you.

In your statement as to how you handled your production before the shutdown we suspect we see signs of exaggeration.

And now we have printed your letter in full—even to the advertisement for your paper for which ordinarily we should get regular advertising rates. Possibly we have failed to answer it all. If so will try again.

We appreciate the more friendly tone employed at the close of your letter. We hope you make a big success out of the oil business—that if you find it takes more money than you have to play the big opportunity which you undoubtedly face, you get the help you need when you need it and do not have to sell out to a major oil company.

RAY L. DUDLEY,
Publisher The Oil Weekly

Notes for the Equipment Buyer and User

Hughes Tool Company Starts Expansion Program at Houston

A $3,500,000 expansion program has been started by Hughes Tool Company at Houston.

At the Hughes Street plant, contract has been let for building improvements totaling $1,700,000, and an additional $1,800,000 will be spent on new equipment.

The expansion program covers additions to three structures and four separate buildings. The additions include two concrete and brick, two-story machine-shop extensions, one to be 420 by 20 feet, and the other 500 by 20 feet. A two-story concrete and hollow tile addition will also be built to the present warehouse.

There will be one small concrete warehouse and three small galvanized iron buildings, as well as considerable miscellaneous rearranging of equipment.

Oil Well Supply Company Sales Personnel Reassigned

Oil Well Supply Company, United Steel Corporation subsidiary, has announced appointments and reassignments of sales department personnel throughout the organization. Because of the numerous field establishments of Oil Well Supply Company, the reassignments are nationwide in scope.

Lloyd E. Tracy has been appointed general manager of sales, with headquarters at Dallas. He will be assisted by F. D. Smith and A. C. Michaelis.

George A. Hays, vice president with headquarters at Dallas, will devote his full time to major sales problems in all domestic areas. He formerly served the Midwest division only.

John M. Post will continue as manager of tubular division of the general sales department, with headquarters at Pittsburgh. He will be supported by F. W. Little, assistant manager of tubular division.

V. J. Waters, as a member of the general sales department, will continue as manager of used equipment department and manager of merchandise claims department, with headquarters at Dallas. M. D. Routzon has been appointed assistant manager of these departments.

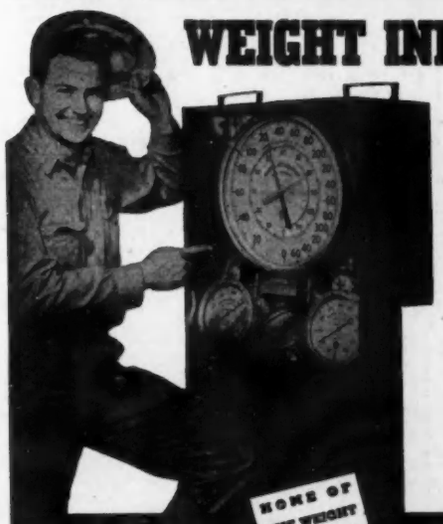
Kenton Chickering will continue to head the advertising and catalog section, Dallas.

M. E. Nicklin will continue as manager of the export division and will be supported by M. E. Keenan, manager of export sales. The export division office is located at New York.

R. R. McAfee, Columbus, Ohio, succeeds F. D. Smith as manager of the eastern division, and will be supported by C. H. Maynard, assistant manager, eastern division, and L. M. Woltz, tubular sales representative, eastern division, both located at Columbus, Ohio.

K. B. Winstead succeeds Tracy as manager of the Midwest division and will make his headquarters at Dallas. He will be supported by J. S. Fuller, division engineer, R. H. Christy, assistant to the division manager at Dallas; William Heldmar, assistant division manager at Tulsa; Carl C. Egner, assistant division manager at Houston; and later by Paul H. Shepherd, assistant division manager at Fort Worth. Shepherd is on leave of absence at Washington, where he is chief of facilities review section, transportation division, Petroleum Administration for War.

Warner F. Parker, Los Angeles, succeeds L. L. Mitchell as manager of California division. Mitchell is transferred to Oil City, Pennsylvania, as assistant treasurer. Parker will be supported by Clarence J. Hill, assistant



WEIGHT INDICATOR POINTS

READABILITY—PORTABILITY
RUGGEDNESS
THE *UNITIZED* HAS THEM ALL

The Martin-Decker Unitized is the pace-setter in portable mud pump gauges.

READABLE—The gauge hand revolves before stationary dials, permits easy reading of pressure at a glance from any distance.

RUGGED — Sturdy conventional construction permits ready repairs in the field by any good mechanic—if ever necessary.

PORTABLE—Completely self-contained, with oil-sealed gauge, diaphragm unit, pulsation damper and vernier mechanism built right into the heavy brass case. Quick action coupling permits fast installation.

HOME OF THE WEIGHT INDICATOR

MARTIN DECKER CORP.

LONG BEACH, CALIFORNIA

SAN JOAQUIN VALLEY A. F. McQUISTON BAKERSFIELD CALIF.
MID CONTINENT DISTRIBUTOR REED ROLLER BIT COMPANY HOUSTON TEX.

ORBIT

MASTER VALVES
with
UNEQUAL FLANGES

The **ORBIT GEAR OPERATED MASTER VALVE** makes your Christmas Tree more compact by eliminating the use of an adapter flange — also eliminating chances for additional gasket leaks. The Unequal Flanges are cast integral with the body of the Valve.

Orbit Gear Operated Master Valve

This valve can be furnished thru all fabricators of Xmas Trees or thru any of your local supply stores at a price comparable to that of leading plug valves, **YET,** this valve requires no lubrication to effect a seal.

See Pages 2194 to 2211 in 1944 Composite Catalog

Specify

ORBIT VALVES

OIL WELL IMPROVEMENTS COMPANY

Since 1912

TULSA, OKLAHOMA

to division manager; R. F. Cann, manager of tubular sales; R. T. Watkins, manager of machinery sales; and Albert Lasken, Jr., manager of stores and general sales for the California division.

District manager appointments include: Harold Wright, succeeding L. M. Woltz as manager of the Ohio district, with headquarters at Columbus; C. L. Benezette, Mt. Pleasant, succeeding C. H. Maynard as manager of the Michigan district; C. A. Bell, Houston, district manager for the Gulf Coast district, succeeds R. H. Christy.

Lufkin to Build and Sell Cooper-Bessemer Engines

Lufkin Foundry & Machine Company, Lufkin, Texas, by arrangement with The Cooper-Bessemer Corporation, will manufacture completely and sell two of the oil-field size Cooper-Bessemer engines. Namely, the GSC 5½ x 7, 2-cylinder, 2-cycle, 25 to 35 horsepower, and the GSD 7½ x 9, 2-cylinder, 2-cycle, vertical engine. These engines are of the medium speed class, running from 300 to 600 rpm which are conservative rates established for oil field engines for a long period of time.

The new units will be known as the Lufkin-Cooper-Bessemer and will be sold only by Lufkin's organization and its branches in all parts of the oil producing country and also through The Cooper-Bessemer Corporation.

☆

RIVERS REAVES has resigned his position on the editorial staff of THE OIL WEEKLY. For the past two years he had served as Gulf Coast district editor.

Advertisers' Index

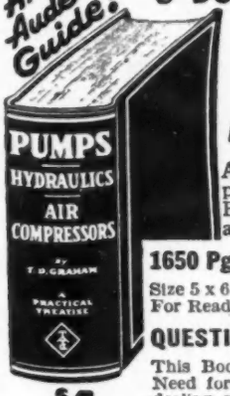
* Indicates detailed information on products and services included in 1943-44 edition of Composite Catalog of Oil Field and Pipe-Line Equipment.

American Association of Petroleum Geologists 66
*American Cable Division American Chain & Cable Co. ..... II Cover
Associated Engineers 64
Theo. Audel & Co. 68
*Axelson Manufacturing Co. 51
*Baldwin-Duckworth Division Chain Belt Co. 41
Wm. M. Barret, Inc. 64
*Bethlehem Steel Co. 21
*Brown Oil Tools, Inc. 46
*Chain Belt Co. 41
The Continental Supply Co. 33
*Fred E. Cooper 43
*Cummins Engine Co. 31
*Dresser Manufacturing Co. 68
Foote Bros. Gear & Machinery Corp. 37
Ft. Worth Laboratories 64
*Gaso Pump & Burner Manufacturing Co. 23
*The Goodyear Tire & Rubber Co. 1
*Gray Tool Co. 45
*The Guiberson Corp. 54
Houston Laboratories 64
Houston Oil Field Material Co. ..... III Cover
*Hughes Tool Co. ..... IV Cover
*International Harvester Co. 4
The International Nickel Co. 53
*Justrite Manufacturing Co. 66
Ladish Drop Forge Co. 47
*Lane-Wells Company 5
*Larkin Packer Co. 8
*Le Roi Co. 59
*Link-Belt Co. 17
A. M. Lockett & Co. 65
Macwhyte Co. 3
*Martin-Decker Corp. 67
Mayes Bros., Inc. 35
*The National Supply Co. 18-19
*Oil Well Improvements Co. 68
*Patterson-Ballagh Corp. 25
*Pelican Well Tool & Supply Co. 63
Precision Inspection Service 64
*Raybestos-Manhattan, Inc. 50
The H. M. Sawyer & Son 61
*Schlumberger Well Surveying Co. 2
Seismic Explorations, Inc. 29
Seismograph Service Corp. 6
Southern Engine & Pump Co. 65
*Spang-Chalfant Division The National Supply Co. 18-19
Standard Oil Company of California 48
Standard Oil Company (New Jersey) 26-27
*Standco Brake Lining Co. 64
*Tretolite Co. ..... I Cover
*Western Gear Works 60
*Wheeling Machine Products Co. 46

Free Examination

PUMPS

An Audel Guide! 3 Books in One!



Now Ready—
AUDELS PUMPS
HYDRAULICS
AIR COMPRESSORS

A New Modern Comprehensive Guide for Engineers, Pump Operators and Mechanics.

1650 Pgs., 1654 Illustrations

Size 5 x 6¾ x 1⅞—Fully Indexed For Ready Reference including

QUESTIONS AND ANSWERS

This Book Covers a Long Felt Need for One Inclusive Volume dealing with the whole field of modern Pumps, Hydraulics, Air Compressors and the many lines that tie in. Easy to understand.

$4 COMPLETE

PAY ONLY $1 A MO.

To get this assistance for yourself, simply fill in and mail *FREE COUPON* today.

AUDEL, Publishers, 49 W. 23 St., New York 10

MAIL AUDELS PUMPS, HYDRAULICS, AIR COMPRESSORS (Price $4) on 7 days free trial. If O.K., I will remit $1 in 7 days and $1 monthly until the $4 is paid. Otherwise I will return it.

Name_____

Address_____

Occupation_____

Employed by_____

T.O.W.

4" LATERAL
entering 6" Main

Both the 4" and the 6" lines above were coupled-up with ready-made "Dressers." Plain-end pipe was used—and the only tool, was a wrench.

•

Overnight delivery of "Dressers" to the Southwest from complete stocks at Houston

PHONE: CHARTER 4-4723; L. D. 2107

DRESSER
HOUSTON WAREHOUSE
1121 Rothwell St. Sec. 16, Houston, Texas